TEKTRONIX®

DC 505A UNIVERSAL COUNTER/TIMER

INSTRUCTION MANUAL

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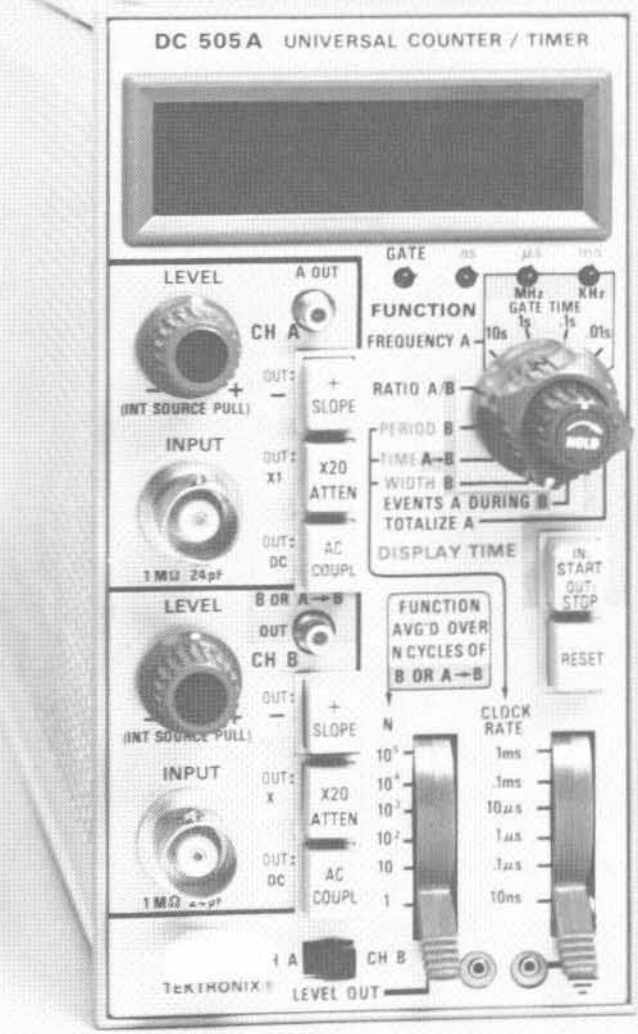

DC 505A UNIVERSAL COUNTER / TIMER
GATE
FUNCTION
FREQUENCY A
RATIO A/B
PERIOD B
TIME A→B
WIDTH B
EVENTS A DURING B
TtotalIZE A
MHz
KHz
GATE TIME
10s
1s
.1s
.01s
DISPLAY TIME
IN START
OUT STOP
RESET
LEVEL
A OUT
CH A
(INT SOURCE PULL)
INPUT
1MΩ 24pF
+ SLOPE
X20 ATTEN
AC COUPL
OUT: X1
OUT: DC
B OR A→B
OUT
CH B
FUNCTION AVG'D OVER N CYCLES OF B OR A→B
N
CLOCK RATE
1ms
.1ms
10µs
1µs
.1µs
10ns
A
CH B
LEVEL OUT
TEKTRONIX

OPERATING INSTRUCTIONS

INTRODUCTION

The DC 505A Universal Counter/Timer has seven measurement functions: frequency counting, finding frequency ratios, period timing, interval timing, width timing, electronic event counting, and manual event counting.

The DC 505A has two input channels (A & B), each having bnc inputs and separate triggering level, attenuators, and coupling mode controls. Both input channels have the same 225 MHz capability. Seven-segment light-emitting diode arrays (LED's) provide a seven-digit visual numerical display. The decimal point is automatically positioned and the leading zeros (to the left of the most significant digit or decimal point) are blanked. Digit overflow is indicated by a flashing display.

Signals to be counted/timed can be applied to either or both channel A or channel B front-panel bnc connector or to the rear interface connector. The DC 505A is designed to operate in a TM 500-Series Power Module.

The DC 505A can be ordered equipped with a temperature-compensated, 5 MHz crystal oscillator to obtain a highly stable and precise internal time base. This option includes a divide-by-five IC counter to produce the 1 MHz clock.

The triggering level of CH A or CH B can be adjusted to a fixed voltage level by monitoring a dc voltage at a front-panel LEVEL OUT jack, or at the rear interface.

Installation

The DC 505A is calibrated and ready for use as received. Turn the Power Module OFF before inserting the instrument. Do not use excessive force when installing the DC 505A and be certain that the front panel of the instrument is aligned with the edges of the Power Module compartment. Refer to Fig. 1-1; install the DC 505A and turn the Power Module ON.

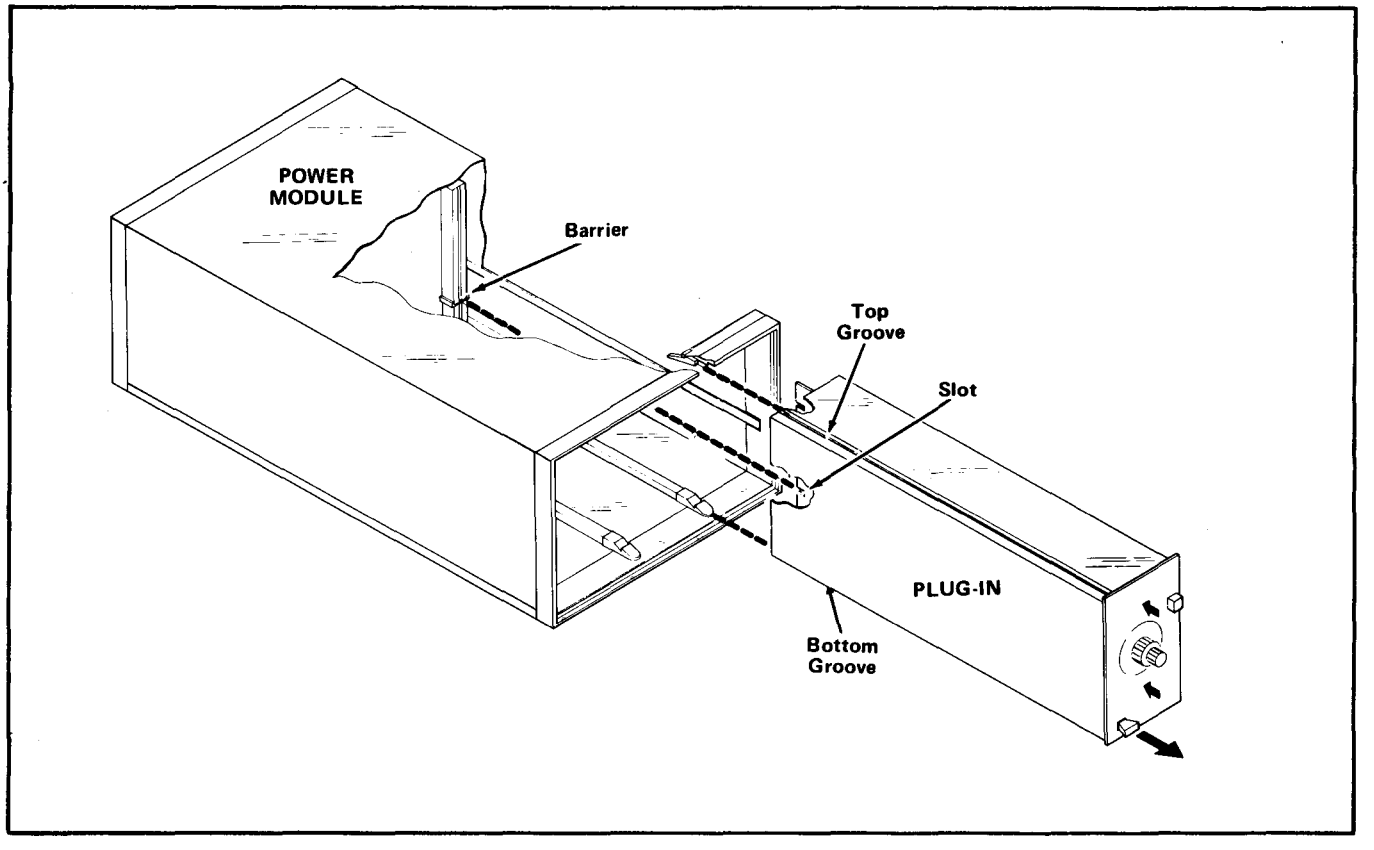


Fig. 1-1. Plug-in installation/removal.

Operating Instructions—DC 505A

When DC 505A's with serial numbers B010630 and above are to be installed in the low-power compartments of a particular TM 500 Power Module, modifications to the Power Module must be performed as indicated below. Refer these Power Module modifications to qualified service personnel.

1. TM 503 with more than **two** DC 505A's installed:

   Replace C35 (11,000 μF) with a 18,000 μF capacitor, Tektronix Part Number 290-0508-01.

2. TM 504 with more than **two** DC 505A's installed:

   Change F35 (5 A fuse) to a 7.5 A fuse, Tektronix Part Number 159-0096-00.

3. TM 515 with more than **three** DC 505A's installed:

   Change F135 (7.5 A fuse) to a 10 A fuse, Tektronix Part Number 159-0057-00.

4. TM 506 with more than **three** DC 505A's installed:

   Change F35 (7.5 A fuse) to a 10 A fuse, Tektronix Part Number 159-0057-00.

OPERATIONAL CHECK

Controls and Connectors

Pull out the tab labeled "Controls, Connectors, and Rear Connector Pin Assignments" (at the rear of the manual) to expose the front panel illustration. Review the functions of the controls, connectors, and indicators before continuing with the operational checks.

Display Tests

With no signal applied, test the DC 505A's readout displays and switching logic. The following checks will test most of the counter's major circuits and ensure its readiness to make measurements. If any malfunctions are detected, first refer to the Adjustment Procedure in the service section of this manual, then the System Maintenance Section of the Power Module manual.

Readout Segment Test. Press the RESET button to check the seven character segments of each digit. A row of 8's should be displayed. This check of the display devices and drivers can be done at any time.

FREQ A Displays. Using the FUNCTION switch, select a FREQ A GATE TIME of .01 s. Check the decimal point location, leading zero suppression, and units indicators according to Table 1-1. The decimal point and units indicator lights in any setting should not change when either the N switch or CLOCK RATE switch positions are changed.

TABLE 1-1

GATE TIME	Unit Indicators	Decimal Point
.01 s	MHz	.0000
.1 s	MHz	.00000
1 s	kHz	.000
10 s	kHz	.0000

With the DISPLAY TIME control in the full ccw position, observe that the GATE indicator flashes rapidly for short GATE TIMEs and more slowly for longer GATE TIMEs. Using a short GATE TIME, rotate the DISPLAY TIME control slowly cw. Observe that the GATE light will stay off for a longer and longer time, until the control clicks into the HOLD detent position, holding off the GATE indefinitely. Return the DISPLAY TIME control to the ccw position.

RATIO A/B and EVENTS A DURING B Displays. Set the FUNCTION switch to RATIO A/B and the N switch to 10^5. Check the readout displays according to Table 1-2. Set the FUNCTION switch to EVENTS A DURING B and the N switch to 10^5. Again check the readout displays using Table 1-2. (Changing the CLOCK RATE switch should have no effect on the decimal point appearing in the readout display in either of these FUNCTION switch settings.)

TABLE 1-2

N Switch	Decimal Point
10^5	.00000
10^4	.0000
10^3	.000
10^2	.00
10	.0
1	0

The GATE and units indicators should remain off.

PERIOD B, TIME A→B and WIDTH B Displays. Set the FUNCTION switch to PERIOD B, the CLOCK RATE switch to 10 ns and the N switch to 10^5. Check the readout display according to Table 1-3.

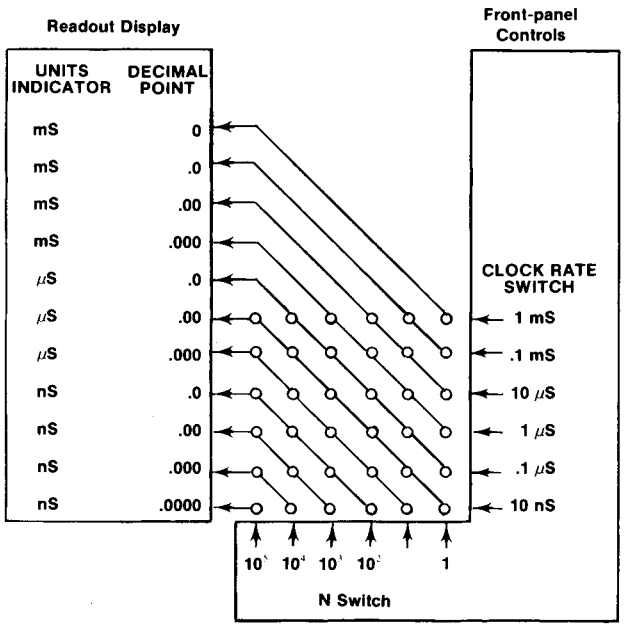
Change the FUNCTION switch to TIME A→B. Retain the same settings on the CLOCK RATE and N switches. Check the readout displays according to Table 1-3.

Change the FUNCTION switch to WIDTH B and make the same check of the readout displays using Table 1-3.

NOTE

Table 1-3 and the diagram are drawn as an aid to troubleshooting if the decimal points and units indicators are non-functioning or incorrect in any of the time interval measurement settings. See Theory of Operation, Decimal Point and Parameter Selection.

Table 1-3



TOTALIZE A Display. Set the FUNCTION switch to TOTALIZE A. Observe a zero at the right of the readout display. The GATE light should turn on when the IN: START, OUT: STOP button is pushed in, and turns off when button is released. The units indicators and decimal points should remain off.

CHANNEL A SLOPE. With the FUNCTION control set to TOTALIZE A, CH A to +SLOPE, depress IN: START, OUT: STOP button. Turn the CH A LEVEL control knob fully cw. Readout display should increase one count each time the knob is turned from cw to ccw (past centered LEVEL position). Verify that the count does not increase when the knob is turned from ccw to cw.

Change to −SLOPE. Push the RESET button to clear the display. Readout should now increase one count each time the CH A LEVEL control is turned from ccw to cw. Turning the LEVEL control from cw to ccw should not increment the display.

CHANNEL B SLOPE. Set FUNCTION control switch to PERIOD B, CH B to +SLOPE, N (averaging factor) control to 1. Push the RESET button. Check that the GATE light turns on when the CH B LEVEL control knob is turned from the cw to the ccw position. Turning the knob back to cw should have no effect on the GATE light. Another turn from cw to ccw turns the light off.

Change to −SLOPE. Push the RESET button. Check that the GATE light turns on when CH B LEVEL control knob is turned from ccw to cw. The light should remain on when the knob is turned back to ccw. The GATE light turns off on the next turn from ccw to cw of the LEVEL control knob.

Channels A & B. The channel A & B input circuits, with the exception of the attenuators, can be checked in a no-signal-input condition by generating pseudo-triggers with the LEVEL controls.

Select +SLOPE for one channel and −SLOPE for the other channel. Set FUNCTION to TIME A→B, CLOCK RATE switch to 1 ms and N switch to 1. Rotate CH A LEVEL back and forth through its selected slope until the GATE light turns on. Rotate CH B LEVEL back and forth through its selected slope until the GATE light turns off. The resultant display is the time interval between these two trigger events.

If the GATE light cannot be turned on or off with this method, consult the Service section of the manual for troubleshooting aids.

RATIO A/B Check. Connect an approximately 1 to 5 MHz signal from a signal source, for example the SG 503, into the input of both CH A and CH B using a Dual Input Coupler (Tektronix Part No. 067-0525-00). Set the FUNCTION control switch to RATIO A/B, +SLOPE on both channels. Check the readout display according to Table 1-4.

Change both channels to −SLOPE and make the same check of the readout display using Table 1-4.

TABLE 1-4

N Switch	Decimal Point (±1 count)
10^5	1.00000
10^4	1.0000
10^3	1.000
10^2	1.00
10	1.0
1	1

INPUT CONSIDERATIONS

Input Sources

The switch concentric with the LEVEL control of each channel selects either the front-panel bnc connector (external), or the rear interface connector (internal) pins; Channel A via pin 16A, and Channel B via pin 17B.

The External inputs present high impedance of approximately 1 MΩ, paralleled by about 24 pF. The Internal input circuits present nominal 50 Ω impedances to match typical coaxial cable signal connections.

Input Coupling

Front Panel pushbuttons select ac (Capactive) or dc (Direct) coupling for each channel's input signal. This coupling takes place after the signal arrive from the selected source and before they are passed on to the attenuators of each channel.

Attenuators and Maximum Input Volts

The front-panel pushbutton, when out, provides no attenuation to the input signal (X1). In this mode, the maximum safe input voltage is 50 V (dc + peak ac), at 10 kHz or less (CH A or CH B). With the X20 attenuator selected, the maximum safe input voltage is 250 V (dc + peak ac) at 1 MHz or less (CH A or CH B). (See Table 1-6.)

Sensitivity and Frequency Range

CH A and CH B will respond to signal amplitude of at least 50 mV rms sinewave, times attenuation, to 150 MHz, and 100 mV rms sinewave, times attenuation, from 150 MHz to 225 MHz.

Depending on the coupling mode selected, the low frequency limit for each channel is either 0 Hz (dc-coupled) or 10 Hz (ac-coupled).

Slope and LEVEL

A front-panel pushbutton for each channel determines whether the trigger circuits will respond to either positive- or negative-going transitions of each input signal.

The LEVEL control for each channel allows the operator to move the hysteresis window of the trigger circuit to an optimum level on the input signal to ensure stable triggering. See Fig. 1-2. The LEVEL control adjusts over ±2.0 V of the input signal in the X1 attenuation position. This level can be monitored at the front-panel LEVEL OUT pin jack.

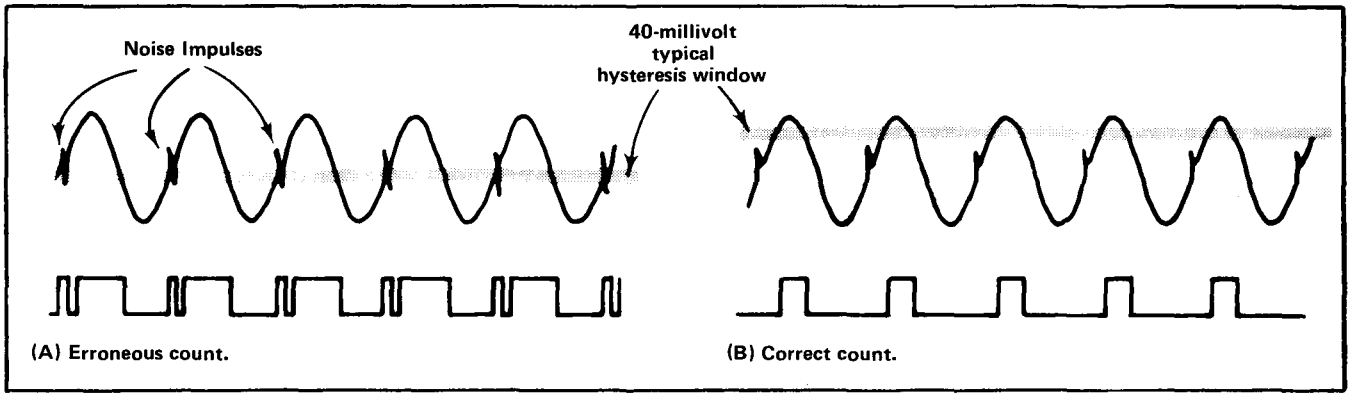


Fig. 1-2. Triggering circuit responses to improper (A) and proper (B) LEVEL settings.

FREQUENCY MEASUREMENTS

FREQUENCY A

To measure and display the frequency of a signal up to 225 MHz, set the FUNCTION switch to one of the shorter GATE TIMEs bracketed under the heading of FREQUENCY A. Make sure the LEVEL control is pushed in and connect the signal to the CH A INPUT. Set the DISPLAY TIME control ccw.

Triggering

The CH A LEVEL, Slope, Coupling, and attenuator controls all affect the ability to make a measurement. In general, the trigger controls are similar to oscilloscope controls, except that the end result is not a stable waveform graphic display, but a stable digital frequency display.

Coupling and Slope. Use ac-coupling for most frequency measurements to avoid re-adjusting the LEVEL control for changing dc levels. The repetitive nature of the signals makes Slope selection insignificant for frequency measurements.

Attenuators and LEVEL. Signals less than 3 V peak-to-peak, should not be attenuated. For higher amplitude signals, select an attenuation factor such that the attenuated signal falls into the range of 150 mV to 4 V, peak-to-peak. The LEVEL control must be varied for a stable reading. It will not be touchy unless the signal amplitude and frequency are close to (or perhaps beyond) the specified limits.

A signal that looks stable on an oscilloscope may still show jitter when measured with 7-digit resolution. If the count varies from reading to reading, it is probably due to jitter in the signal source. If the count changes unreasonably, the DC 505A is not being triggered properly, either because the controls are not set right or the signal is beyond the counter's capabilities.

For frequency measurements, all CH B trigger settings have no effect. "N" or "CLOCK RATE" settings are irrelevant.

Measurement Intervals

To adjust the trigger controls, choose a short GATE TIME such as .1 s or .01 s. This gives rapid feedback via the display as to whether the counter is being triggered or not. If it is, numbers will appear in the display. (If the frequency is below 100 Hz, numbers may not appear during the shortest gate times. For such low frequencies, a PERIOD measurement is better suited.)

Final selection of GATE TIME depends on the frequency being measured, desired resolution, and willingness of the operator to wait for a measurement. Using short gate times, higher frequencies may be measured, but at the expense of the greater resolution capabilities of the longer gate times.

Resolution. A 10 s GATE TIME means the operator must wait 10 seconds for a measurement to be made and displayed. It is the only way to get best possible resolution and accuracy for signals below 1 MHz. Even then, a 10 second count will display fewer than the available 7 digits.

Overflow. Through intentional use of "overflow" displays, it is possible to improve the resolution of the counter. Choose a GATE TIME that displays the most significant number of the measurement as far to the left as possible. Note the numbers displayed to the right of the decimal. Move the decimal point to the left by choosing longer GATE TIMEs until the desired resolution is achieved. The display will flash when the most significant number overflows the last storage register. The relationship between GATE TIME, measured frequency, displayed digits, and overflow is shown in Table 1-5.

TABLE 1-5

GATE TIME	>100 MHz	10 MHz to 100 MHz	1 MHz to 10 MHz	<1 MHz
.01 s	7 digits	6 digits	5 digits	4 digits
.1 s	Overflow	7 digits	6 digits	5 digits
1 s	Overflow	Overflow	7 digits	6 digits
10 s	Overflow	Overflow	Overflow	7 digits

Measurement Rate

Once a stable measurement is obtained, the rate at which measurements are made can be controlled by the DISPLAY TIME control. Turning the control cw holds off the gate and stores the display for a longer time before a new measurement is made and displayed. DISPLAY TIME and GATE TIME together complete a measurement-display cycle.

The DISPLAY TIME control is uncalibrated and variable from about 0.1 s at the ccw end to about 10 s at the cw end. At the cw end, there is a detent position called HOLD. In HOLD, the last count taken will be stored and displayed for an indefinite time. A new count and display may be initiated by pushing the RESET button, turning the DISPLAY TIME control ccw, or changing to another GATE TIME.

RATIO MEASUREMENTS

In the RATIO A/B mode, the frequency of the signal applied to CH A is divided by the frequency of the signal applied to CH B, and the resultant ratio is displayed. Note that the normal "frequency" mode is basically a ratio mode, in which the ratio of the unknown signal to the internal clock is displayed. (Decade scaling of the internal clock and decimal point positioning normalizes the display relative to kHz or MHz units.)

Triggering

The operation of CH A and CH B trigger controls is the same as for frequency and period measurement. In fact, since both channels must be triggered to obtain a display, it may be desirable to set the trigger controls independently. This may be accomplished as follows:

1. Go to the FREQUENCY A mode and adjust the CH A trigger controls for a normal frequency measurement.

2. Go to the PERIOD B mode and adjust the CH B trigger controls for a normal period measurement.

3. Leaving CH A and CH B trigger controls as they were, go the RATIO A/B mode. The correct ratio should be displayed.

Resolution

The N switch may now be operated to select maximum resolution. For most measurements, the smallest value of "N" that produces a useful number of digits will be best.

PERIOD MEASUREMENTS

Gating

Period measurement is provided in universal counter/timers primarly to overcome a basic limitation of counters, i.e., the long time required to make a high resolution, high accuracy measurement of low frequency signals. For example, a 1 kHz signal requries 1,000 seconds of GATE TIME to accumulate a million counts. However, in only one second, a 1 kHz signal can gate a count of one million clock pulses from a 1 MHz clock.

Simply stated, the PERIOD B mode reverses the functions of signal and clock as compared to the FREQUENCY A mode. In FREQUENCY A, the gate is held open for some number of clock pulses while signal events are counted, then displayed. In PERIOD B, the gate is held open for some number of signal events (N), while clock pulses are counted, then displayed.

Averaging

Resolution and accuracy is improved by averaging the signal value over a large number of signal events. This increases the total time to take a measurement, i.e., similar to selecting a longer GATE TIME in the FREQUENCY A mode. The best resolution possible for period measurements is 0.1 ps.

Low Frequencies

Period measurements of signal below 10 Hz, and particularly in the lowest decade from 0.1 Hz to 1.0 Hz, become rather sensitive to wave shape and amplitude. Since it is desirable for the signal to pass through the trigger hysteresis abruptly, square waves are preferred. Wave shapes other than square-waves can be measured accurately at the very low end and if the input amplitude is kept high so that the trigger input is driven hard.

TIME INTERVAL MEASUREMENTS

General

Time interval measurements are performed using the TIME A→B or WIDTH B modes. The TIME A→B mode measures and displays the elapsed time interval between the triggering level of CH A and the subsequent triggering level of CH B. The WIDTH B mode measures and displays the elapsed time interval between the selected triggering level on the starting slope of the pulse duration to be measured and the same triggering level on the opposite polarity ending slope.

The voltage levels necessary to establish the triggering points on any selected slope are monitored and set with DVM readings at the CH A/CH B LEVEL OUT pin jacks on the front panel or on pin 22A at the rear interface. Fig. 1-3 illustrates typical LEVEL OUT voltage settings for various time interval measurements. Fig. 1-3 is limited to positive-going pulses above ground reference (0 V), but the same procedure is essentially followed for input signals whose peak-to-peak amplitude falls within the triggering level range. Only the voltage polarities and +SLOPE or

—SLOPE selection need be considered when determining triggering levels not illustrated in Fig. 1-3. When making these measurements, each channel must be DC COUPLED and coaxial cables must be terminated properly in order to maintain signal fidelity.

WIDTH B Mode

In order to measure pulse duration (Fig. 1-3, waveform 3) the 50% level must be determined. Apply the input signal to CH B (use X1 ATTEN) and set FUNCTION switch to WIDTH B. Set CH B LEVEL control fully counterclockwise (clockwise for input signals below ground). GATE light must be out.

NOTE

Rotating a level control moves the triggering hysteresis window up or down through the peak-to-peak amplitude swing of an input signal. Any time that the GATE light is out, the hysteresis window is outside the signal limits and the counter is not triggered. The hysteresis window is typically about 40 mV.

Rotate CH B LEVEL control until the GATE light just comes on and record the first DVM reading. Continue rotating CH B LEVEL control until the GATE light just goes out and record the second DVM reading. If the GATE light does not go out, reduce input signal amplitude or use X20 ATTEN. Subtract first DVM reading from second reading to obtain the peak-to-peak amplitude, then divide by 2. The answer is the desired 50% level. Reset CH B LEVEL control so that DVM indicates the 50% level, then read the pulse duration from the DC 505A display.

TIME A→B Mode

This measurement requires input signals to both CH A and CH B, but peak-to-peak signal amplitudes should first be determined using the WIDTH B mode (refer to WIDTH B Mode instructions). For TIME A→B measurements, follow these steps:

1. Set FUNCTION switch to WIDTH B.

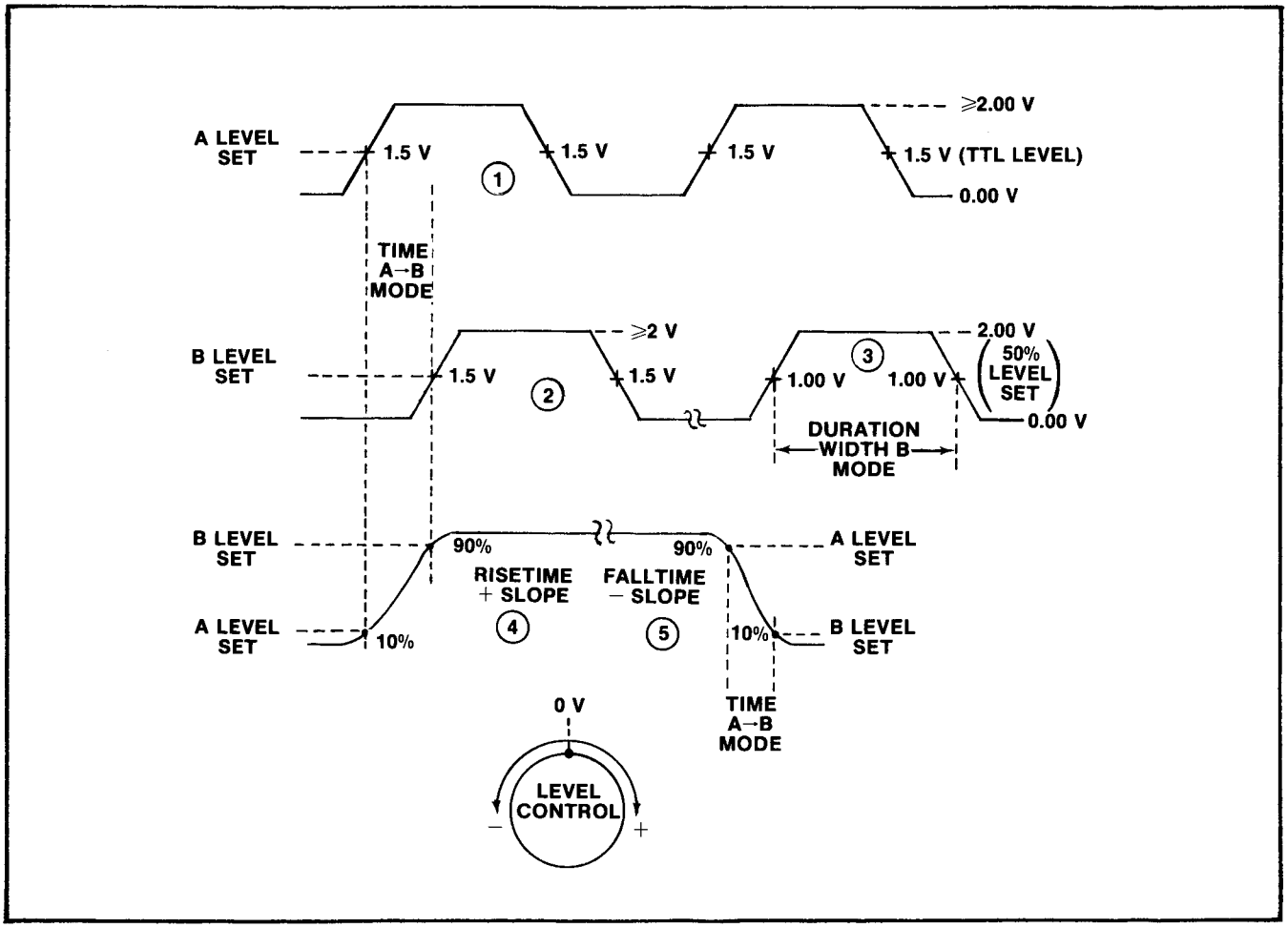


Fig. 1-3. Typical CH A and CH B LEVEL OUT voltage settings for various time interval measurements.

2. Using a DVM, the CH B LEVEL control, and the GATE light indications, determine the peak-to-peak amplitude of the signal to be applied to CH B. Calculate desired triggering level for CH B.

3. If signal to be applied to CH A is different in amplitude than CH B signal, repeat step 2 to determine the peak-to-peak amplitude of the signal to be applied to CH A. Calculate the desired triggering level for CH A.

4. Set CH B to desired triggering level as calculated in step 2.

5. Set FUNCTION switch to TIME A→B.

6. Set CH A to desired triggering level as calculated in step 3.

7. With signals connected to the proper channels, read the elapsed time interval between the triggering level of CH A and the subsequent triggering level of CH B.

Time Interval Averaging

Time interval averaging provides an economical method of greatly increasing the accuracy and resolution of time interval measurements on repetitive signals. The basis of time interval averaging is the statistical reduction of the ±1 count error. If the ±1 count error is truly random, then as more intervals are averaged, the measurement will tend to approach the true value of the time interval. For time interval averaging to work, the time interval being measured must be repetitive and have a repetition frequency that is non-synchronous to the counter clock rate.

Time interval averaging of N>1 should be used whenever the ±1 count error of a repetitive signal (averaging switch actually set to 1) significantly degrades the accuracy and resolution of the measurement. When a measurement is made and the least significant digits appear unstable (due to inherent instrument noise), improvements in accuracy and resolution can be obtained by either increasing the average factor N, or increasing the CLOCK RATE.

Single-Shot using HOLD

Single-shot time intervals can be measured in either the TIME A→B or WIDTH B modes by setting the DISPLAY TIME control to the HOLD position. For the HOLD position, the counter makes a single measurement (with the function averaged over N cycles of B or A→B), displays the count and holds the answer until the operater pushes the RESET button to clear the display and rearm the counter circuits for another single-shot measurement.

EVENT MEASUREMENTS

In the EVENTS A DURING B mode, signal events applied to CH A INPUT are counted and the accumulated total is displayed for the time that the signal applied to CH B INPUT causes channel B to be triggered high and the counter/timer gate opened. This mode is similar to the TOTALIZE A mode.

The following procedure can be used to make a measurement like that shown in Fig. 1-4.

1. Apply the events to be counted to CH A. Set the FUNCTION switch to FREQUENCY A and CH A slope switch to +SLOPE. Adjust the CH A LEVEL for a stable frequency display.

2. Apply the counter/timer gate open control signal to CH B. Set the FUNCTION switch to PERIOD B and CH B slope switch to +SLOPE. Adjust the CH B LEVEL for a stable period display.

3. Set the FUNCTION switch to EVENTS A DURING B.

4. When the CH B signal excursion occurs, CH B is triggered and the gate opens, allowing the CH A pulses to be counted.

Averaging

Averaging provides an economical method of increasing the accuracy and resolution of repetitive event per interval measurements. The basic of averaging is the statistical reduction of the ±1 count error. If the ±1 count error is truly random, then as more intervals are averaged, the measurement will tend to approach the true value of the number of events per interval. For averaging to work, the events being measured must be repetitive.

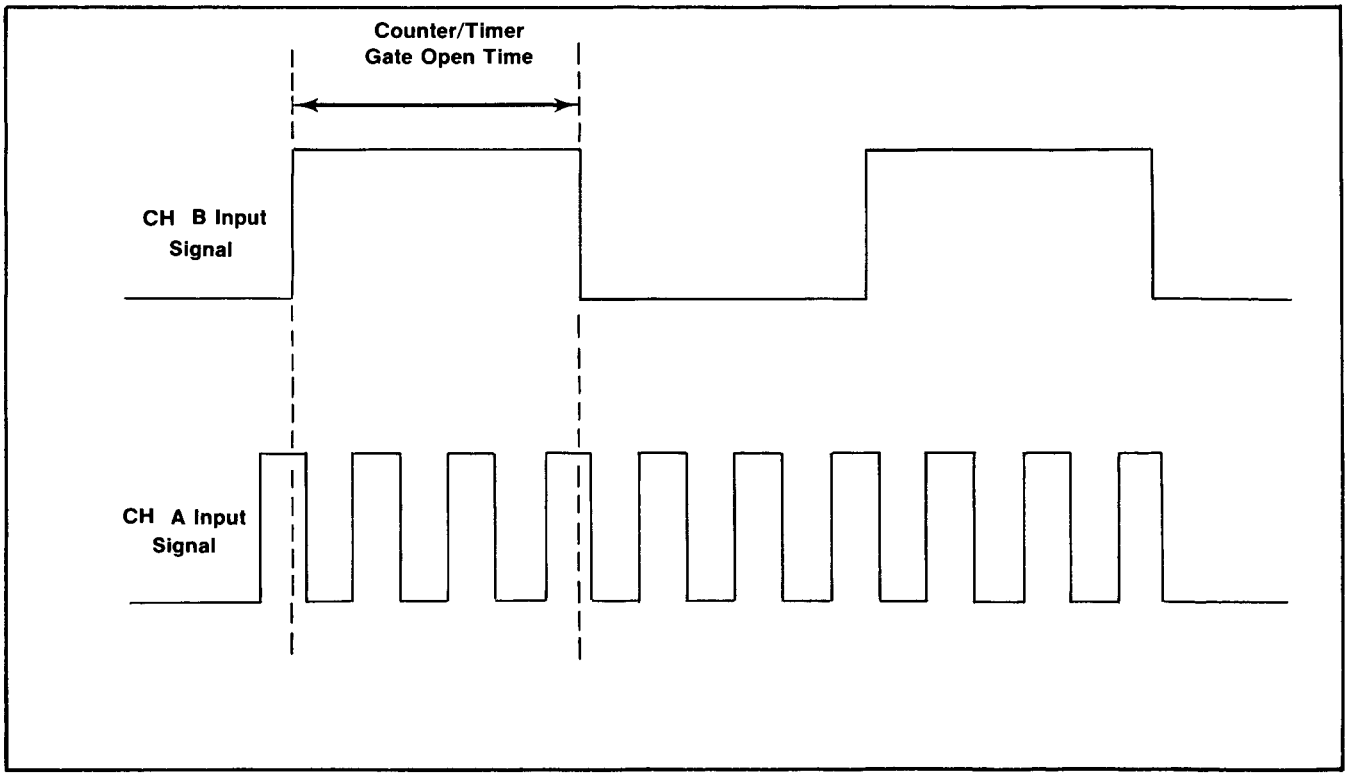


Fig. 1-4. Illustration depicting CH A pulses and portion of CH A pulses being counted during the counter/timer gate open time (controlled by CH B signal).

Event per interval averaging should be used whenever the ±1 count error from a single event per interval measurement (N switch actually set to 1) significantly degrades the accuracy or resolution of the measurement. When using averaging, the inherent instrument noise will limit the resolution of the measurement.

The accuracy of the event per interval averaging measurement can be determined by using the following formula:

$$\left(\text{fractional part only of } \left| 1 - \frac{\text{freq into CH A}}{\text{freq into CH B}} \right| \right) \sqrt{N} > \frac{1}{\text{fractional resolution required}}$$

TOTALIZING

Purpose

In the TOTALIZE A mode, signal events applied to CH A INPUT are counted and the accumulated total is displayed during the time the IN: START, OUT: STOP button is pushed in. This mode is a manual analog of the frequency mode. Its main application is to accumulate a count of relatively slow and irregular events.

Operation

Apply the signal to CH A and set the trigger controls the same as for frequency measurement.

Starting the Count. Press the IN: START, OUT: STOP button in and adjust the CH A LEVEL control until a count begins to advance. The accumulated count is displayed in whole numbers. Only the CH A trigger controls. The RESET button, and the IN: START, OUT: STOP button affect the display.

Stopping the Count. If the IN: START, OUT: STOP button is released and no other controls are operated, the last total will continue to be displayed. No more incoming events will be added to the total.

Restarting and Resetting. When the IN: START, OUT: STOP is again depressed, incoming events will advance the displayed total. Resetting the count to zero can be done at any time by pressing the RESET button.

FUNCTIONS AVAILABLE AT REAR CONNECTOR

Customizing the Interface

Unassigned pins are available at the rear connector for routing signals to and from the DC 505A for specialized applications (see Rear Connector Pin Assignments in Section 5). One or more compartments of a multi-plug-in Power Module can be wired with barriers installed to provide specific functions between compartments. See Power Module instruction manual for additional information.

Control Lines

These lines allow the user to externally command the DC 505A to certain operating conditions.

A Reset input line, which doubles as an output signal line, clears the counter to zero when a low is applied to it. An input line to disable the flashing overflow display also doubles as an output signal line during overflow. The IN: START, OUT: STOP signal is also addressable via the interface lines.

Signal Lines

These lines provide for signal input to each channel status, clock signal outputs and BCD data outputs.

The Reset, Time-Slot Zero (TSO), Data Good, and Overflow lines report the status of the DC 505A. BCD data lines report the count in an 8-4-2-1, serial-by-digit method.

As long as the Internal Scan Clock Disable line remains high (or open), the Internal Scan Clock output signal is available.

The internal 1 MHz Clock signal is brought to the interface for possible synchronous applications. (An internal switch allows this same line to be used for external 1 MHz Clock input.)

ELECTRICAL CHARACTERISTICS

Performance Conditions

The electrical characteristics are valid only if the DC 505A has been calibrated at an ambient temperature between +20°C and +30°C and is operating at an ambient temperature between 0°C and +50°C, unless otherwise noted.

TABLE 1-6

Channels A and B Input

Characteristics	Performance Requirements	Supplemental Information
Frequency Range		
DC Coupled	0 Hz to 225 MHz	
AC Coupled	10 Hz to 225 MHz	
Sensitivity	50 mV rms sine-wave times attenuation to 150 MHz 100 mV rms sine-wave times attenuation from 150 MHz to 225 MHz	Sine-wave used for measurement
Impedance		1 MΩ paralleled by approximately 24 pF
Maximum Input Voltage (sine waves, dc + peak ac)		
X1 Attenuation CH A or CH B	50 V at 10 kHz or less; derate −20 dB/ decade to 100 kHz. 5 V at 100 kHz to 225 MHz.	
X20 Attenuation CH A or CH B	250 V at 1 MHz or less; derate −20 dB/ decade to 50 MHz. 5 V at 50 MHz to 225 MHz.	
Trigger Level Range	−2 V times attenuation to +2 V times attenuation	
Trigger Level Output (CH A or CH B)	At least −2 V to +2 V	Monitored at front-panel jack or pin 22A at rear interface
Signal Source	Internal (rear connector interface) or external (front-panel bnc)	Selected by pushing in or pulling out front-panel LEVEL control
Slope	Either + or −	

TABLE 1-7

Display Resolution and Accuracy

Characteristics	Performance Requirements	Supplemental Information
FREQ A		
Accuracy	±1 count ± time base accuracy	Signal to noise ratio at inputs must be ⩾40 dB
RATIO A/B		
Accuracy	±1 count of FREQ A ± trigger jitter error of channel B (see Note 1) + $\frac{\text{Frequency into A}}{0.3 \times 10^8}$	
PERIOD B		
Accuracy	±1 count ± time base accuracy ± trigger jitter error of count B (see Note 1) +2 counts (applies to 10 ns clock rate only)	
Resolution	0.1 ps	
TIME A→B		
Accuracy	±1 count ± time base accuracy ± trigger jitter error of channel A (see Note 2) ± chosen time base period/ $\sqrt{N}$ ± channel delay match error of 2 ns + $\left(\frac{10\text{ ns}}{\text{Volt}}\right)$ (B input step volts to LEVEL setting of B − A input step volts to LEVEL setting of A) +2 counts (applies to 10 ns clock rate only) + Note 4 condition satisfied (see Fig. 1-5)	TIME A→B best absolute accuracy with averaging is 3 ns Pulse widths minimum into channel A and B (for TIME A→B) is 5 ns N is the averaging factor
Resolution (Practical Limit)	100 ps	

TABLE 1-7 (cont)

Characteristics	Performance Requirements	Supplemental Information
WIDTH B	± time base accuracy + (Hysteresis error and trigger jitter error, see Note 3) ± chosen time base period)/N + $\left(\frac{10\text{ ns}}{\text{Volts}}\right)$ (LEVEL setting of B to pulse height − Baseline to LEVEL setting of B) Refer to Fig. 1-5 +2 counts (applies to 10 ns clock rate only) + Note 4 condition satisfied	WIDTH B best absolute accuracy with averaging is 1.5 ns
Resolution (Practical Limit)	100 ps	
EVENTS A DURING B Accuracy	± period of signal A/N + (Hysteresis error and trigger jitter error of CH B) (see Note 3) +(Frequency of events into A) $\left(\frac{10\text{ ns}}{\text{Volts}}\right)$ (LEVEL setting of B to pulse height − Baseline to LEVEL setting of B) Refer to Fig. 1-5 + Note 4 condition satisfied	

NOTES

1. Trigger jitter error = (Ratio, Period) $\left(\frac{.01\text{ V}}{\text{dV/dt of triggering edge}}\right)\Big/\text{N}$

2. Trigger jitter error = (Time A→B) $\left(\frac{0.005\text{ V}}{\text{dV/dt of start edges}} \pm \frac{0.005\text{ V}}{\text{dV/dt of stop edges}}\right)\Big/\sqrt{\text{N}}$

3. Hysteresis error and Trigger jitter error =

$$\frac{0.1\text{ V}}{\text{dV/dt of stop edge}} \pm \left(\frac{0.005\text{ V}}{\text{dV/dt of start edges}} \pm \frac{0.005\text{ V}}{\text{dV/dt of stop edges}}\right)\Big/\sqrt{\text{N}}$$

N is averaging factor
dV/dt is limited to a maximum of 0.2 V/2 ns by the amplifier risetimes

TABLE 1-7 (cont)

4. (A) For TIME A→B and WIDTH B measurements, the internal clock rate and the repetition rate of the measured interval must not be synchronous.

(B) For EVENTS A DURING B, the repetition rates of the signals applied to A and B must not be synchronous.

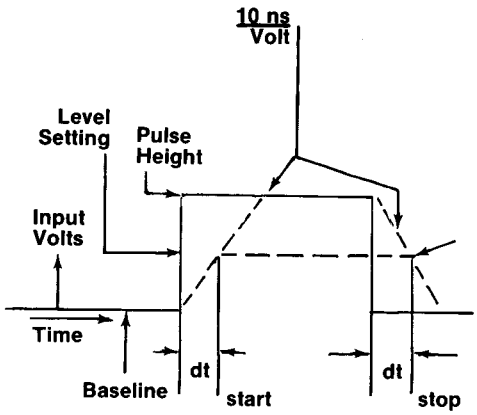


Fig. 1-5.

TABLE 1-8

Internal Time Base

Characteristics	Performance Requirements		Supplemental Information
	Standard	Option 1	
Crystal Frequency	1 MHz	5 MHz	
Stability (0°C to +50°C) After 1/2 Hour Warm-up	1 part or less in 10^5	Within 5 parts in 10^7	
Long-Term Drift	1 part or less in 10^5 per month	1 part or less in 10^7 per month	
1 MHz Clock Signal	Adjustable to within 1 part in 10^7	Adjustable to within 5 parts in 10^9	

TABLE 1-9

Display

Characteristics	Performance Requirements	Supplemental Information
Display Time		Variable from about 0.1 s to about 10 s. Detent position at cw position of DISPLAY TIME knob provides a HOLD mode.
Reset		Pushing the front-panel RESET pushbutton, or grounding pin 26A of the interface connector, resets the counter to zero and totally lights the display (except for the decimal points) for a lamp test.

TABLE 1-10

Outputs

Characteristics	Performance Requirements	Supplemental Information
A OUT		Shaped output, after trigger level and slope selection, of the signal into channel A INPUT connector. Output represents the display information for FREQUENCY A, RATIO A/B, and TOTALIZE A modes
Logic Levels		
0	Approximately −0.1 V into open circuit	
1	Approximately +0.1 V into open circuit	
Propagation Delay from Channel A INPUT to A OUT	Approximately 15 ns	50 Ω reverse terminated.
B or A→B OUT		Shaped output after trigger level and slope selection of either the Channel B signal or the A→B signal. This output represents the continuous signal used in generating the display gating for the RATIO A/B, PERIOD B, TIME A→B, WIDTH B and EVENTS A DURING B modes.
Logic Levels		
0	Approximately −0.1 V into open circuit	
1	Approximately +0.1 V into open circuit	
Propagation Delay from Channel Inputs to B or A→B OUT	Approximately 15 ns	50 Ω reverse terminated.

TABLE 1-11

Environmental

Characteristics	Performance Requirements	Supplemental Information
Temperature		
Operating	0°C to +50°C	Forced air circulation is required from +40°C to +50°C
Storage	−40°C to +75°C	
Altitude		
Operating	To 15,000 feet	
Storage	To 50,000 feet	
Vibration		
Operating and Non-Operating	With the instrument complete and operating, vibration frequency swept from 10 to 50 to 10 Hz at 1 minute per sweep. Vibrate 15 minutes in each of the three major axes at 0.015" total displacement. Hold 3 minutes at any major resonance, or if none, at 50 Hz. Total time, 54 minutes.	
Shock		
Operating and Non-Operating	30 g's, 1/2 sine, 11 ms duration, 2 shocks in each direction along 3 major axes, for a total of 12 shocks	

THEORY OF OPERATION

INPUT AND TRIGGER

AC/DC Selection, Attenuators, And Coupling, CH A & (B)

Channels A and (B) are identical with regard to the amplifiers. The input signal, applied through front-panel INPUT connector J210 (J100), first passes through front-panel push-button switch S215A (S105A) to select ac or dc. X1 or X20 attenuation is selected by front-panel push-button switch S215B (S105B). X20 ATTEN is a frequency-compensated voltage divider, composed of resistor R220 (R110) and Capacitor C222 (C112).

The input signal is coupled to the input field effect transistor, FET Q235A (Q125A) which acts as a source follower. The RC protection circuitry, consisting of capacitor C232 (C122) in parallel with resistor R232 (R122), transmits the signal to reverse-biased diode CR232 (CR122) at the gate of the input FET's.

Input Amplifier, Signal Shaping, Slope Selection And Output

The source follower, Q235A (Q125A), couples the signal to the base of an emitter follower, Q240 (Q130), that drives a complimentary cascode amplifier, Q242 and Q270 (Q132 and Q160).

Adjustment of the LEVEL control at the base of Q270 (Q160) changes the bias on that transistor selecting which portion of the input signal will trigger the DC 505A. Resistors R264 and R265 (R154 and R155) ganged around the LEVEL control, R260 (R150), in conjunction with resistors R262 and R258 (R152 and R148) from either end represent a reverse S-Curve. This allows good sensitivity at the center with a wide dynamic range, in excess of 20 to 1, necessary for the X20 attenuation. The diode, CR264 (CR154), between the center arm of the LEVEL control and the resistor, R268 (R158), at the base of Q270 (Q160) provides first-order temperature compensation.

The collector of Q270 (Q160) is the output of the trigger amplifier which has a gain of approximately 5. This is coupled through emitter follower Q275 (Q165) to a Schmitt Trigger, Q280 and Q282 (Q170 and Q172). The output of this signal shaper, the collector of Q282 (Q172), is ECL compatible and drives the slope selection gate, U190B (U190C). The SLOPE switch, S295 (S185), selects the triggering slope by allowing either a high or a low to drive the exclusive OR slope selection gate.

The shaped signal from both channels is transmitted to the TIME A→B circuitry and the signal selection circuitry. The signal from Channel A couples into U200D to provide shaped output at pin 15 of U200D, which drives resistor R305, R308 to ground and resistor R307 to −10 V, for output to the front panel, A OUT (J310). The signal from Channel B is coupled through additional gates in the Signal Selection circuitry to exclusive OR gate. U190A, to provide shaped output at pin 2 of U190A. This drives resistor R202, R204 to ground and R205 to −10 V, for output to the front panel, B or A→B OUT (J205). Both OUTPUTS are centered around approximately 0 volts with ≈0.25 volt drive from 50 Ω.

Signal Selection

The output from pin 2 of U195A or pin 3 of U200B, a hard wire or ECL combination, is either the shaped signal from Channel A or the Time Select from the front panel. The Time Select ranges from 10 ns to 1 ms determined by the CLOCK RATE switch. This signal is transferred to the gate arming device, U342, in the 10° DCU (Decade Counting Units) Circuit.

The output from pin 14 of U195C or pin 2 of U200A is either the shaped signal from Channel B or the A→B signal from the output, pin 13 and pin 2 of U315B and A, of the TIME A→B circuitry. This signal is transmitted to the Gate and Control Logic Generator circuitry.

Time A→B

The TIME A→B circuitry consists primarily of dual D-type positive-edge-triggered flip-flops, U315A and U315B. These flip-flops hold off Channel B until after a positive-going signal from Channel A into the clock input, pin 6, toggles the first D edge-trigger, which arms the second D edge-trigger. A positive-going signal is thus allowed into clock input, pin 11, to cause a stop signal. To ensure that A is ready to start, a CLEAR signal comes into pin 15 and pin 5 of U315 so that each TIME A→B measurement always starts with A, after the previous measurement.

AVERAGING AND CONTROL

Averaging Divider

The Averaging Divider averages over 1 to 10^5 cycles of B or A→B selected by the N switch on the front panel. To ensure proper gating of averaged pulses in width or period mode, the output of the Width or Period Selection, pin 3 of U340B and pin 15 of U340D is used to activate the Averaging Divider.

For example, in producing a gate for Period measurement, the positive-edge transition from B or A→B is supplied to pin 5 of U340A, coupled through to pin 2 of U340A, and from pin 7 to pin 3 of U340B into pin 9 of U400. This first signal edge, low to high, is ignored by U400 since pin 5 of U400 is held high, because of the signal from pin 3 of U390.

The B or A→B signal supplied to the Width or Period Selection circuitry is coupled into pin 9 of U390. This toggles U390, a fast D-type, positive-edge-triggered ECL device, causing three events. First, the signal from pin 3 of U390 is transferred to pin 13 to enable U495D. Second, this same signal (from pin 3 of U390) transmits a low to the SET inputs of the first (10^0) averaging divider (pin 5 of U400, U410A, and U360A, and pin 12 of U490B) enabling it to count subsequent edges. Third, a pulse is coupled through Q420 from pin 2 of U490 to pin 14 of U455. The averaging dividers, U455, U450, U445 and U440 (used as decade counters) are initially set to nines. The pulse from Q420 causes the dividers to change states to zero's, which starts the main GATE through the gating circuitry, via pin 11 of U497C.

In averaging over 10^1 to 10^5, the next negative going edge into pin 14 of U455 causes U455 to change states at pins 1 and 12. This information is transferred to U495D. Edges from pin 11 of U445 cause U450 to change states at pins 1 and 12, and from U450 through U445 and U440 in the same way, producing the necessary averages to affect the GATE. Averages from 10^0 to 10^5 are selected by the N switch (S950) on the front panel, which determines the divider in use.

The propagation delay of all the dividers is transmitted through U495D both at the start and at the stop of the GATE, except for an average of one. The stop edge from pin 9 of U495D is coupled across U500C, pin 13 to pin 14, and fed to the input, pin 4 of U500A. If an average of just 1 (10^0) is required, the stop edge comes from pin 3 of U400 coupled through U495B into pin 4 of U500A.

For PERIOD averaging, the first positive edge opens the GATE, and 10 or 100 or 1,000 positive pulses later, the GATE closes. The settings of the FUNCTION switch (S195) that measure width, include TIME A→B and EVENTS A DURING B as well as WIDTH B. For width measurements the GATE opens on the first positive edge and closes on the selected negative edge following. The selection, made at the front panel by the N switch, (S950), may be the first negative edge following if 10^0 is chosen, or 10 negative edges later for 10^1, or 100 later for 10^2, etc.

Gate and Control Logic Generator

The GATE generator uses the averaged signal from the averaging dividers to generate the gating for timing measurements that goes to the first Decade Counting Unit (DCU). The signal at pin 9 of U495D is transferred through to the GATE generator, U590, and then through the rest of the gating circuitry to pin 11 of U342.

The very fast counting capability of the DC 505A requires synchronization of the GATE pulse. This is necessary due to the propagation delay of the Averaging Divider, which varies with the amount averaged. U497, U500 and U495 are the signal paths in the synchronization circuitry.

The GATE open or start pulse originates as a result of a signal from B or A→B Select. (The same signal that supplies the input to the Width or Period Selection gates.) A positive-going edge into pin 9 enables U390 causing a pulse to be coupled across Q420, through the Averaging Dividers to pin 12 of U495D, whose output is pin 9. This pulse is transferred from pin 11 of U497C through to pin 6 of U500B, coupled across Q535 to the clock inputs, pins 1 and 13 of the GATE generator, U590A and U590B. This negative-going edge at the clock inputs causes the output at pin 9 to go high. The high transferred to the base of Q506 appears at pin 4 of U495A.

When pin 4 of U495A goes low, the initial start pulse of the GATE (whose output is pin 14 of U497C into pin 11 of U500B) turns off, thus allowing a stop pulse to come from pin 4 of U500A through U495C into pin 9 of U500B. The stop pulse is generated from pin 9 of U495D through U500C, from pin 13 to pin 14, into the input, pin 4 of U500A. If an average of 1 (10^0) is selected, the stop pulse comes from pin 3 of U400. The signal at pin 6, the output of U500B, produces a negative-going edge coupled into the clock inputs of U590 to close or stop the GATE. A negative-going edge into the clock inputs both starts and stops the GATE. After a start and stop of one GATE, another GATE pulse will not occur until the DISPLAY TIME control and U580A and U580B reset the GATE generator, U590.

With the DC 505A's averaging capability in measuring width, it is necessary, in addition to turning a master GATE on and off, to arm and disarm the display counter. In taking N averages of the width of N pulses, the information transferred into the display must be from that portion of the waveform which represents only the width or duration of the pulse. The input width signal is nanded with the main GATE to get a pulsating gate through pins 4, 5 and 6 to pin 3 of U345A which arms and disarms U342.

The DC 505A will make a single shot period measurement as small as 30 or 40 ns. However, for a period consisting of a very narrow pulse, perhaps 2 to 3 ns, it is necessary to ensure that the gate which arms and disarms U342 will occur once, even though the displayed reading would not be meaningful. For input signals longer than 30 or 40 ns, the time interval of the main GATE coming from U590 to the display is accurate in absolute value to within 10 ns.

For a very narrow pulse, 2 or 3 ns, pin 3 of U400 will go from low to high on the step edge of the narrow pulse and will be coupled through to pin 4 of U500A before the GATE open signal can get to pin 5 of U500A. If pin 4 of U500A is already low when the GATE starts through pin 5 of U500A (the $\overline{\text{GATE}}$ start level coupled across Q506 from U590), then pin 2 of U500A will go low as soon as the GATE starts, causing pin 14 of U495C to go high. Resistor, R512 between pin 14 of U495C and pin 9 of U500B and capacitor, C526 to ground causes a 2.5 ns time delay, slowing the signal to pin 9 until after the GATE start signal from pin 14 U497C has been disabled via pin 2 of U495A to pin 10 of U497C. This ensures that a double pulse will occur at pins 1 and 13 of U590. The total cycle from GATE start to GATE stop takes 30 to 40 ns minimum. This is the factor that limits the accuracy of single-shot measurements less than 30 or 40 ns. Width or Period measurements longer than 40 ns (single-shot) are accurate to within 10 ns, due to gating errors.

The .01 s to 10 s logic for the GATE time in FREQUENCY A comes via the 1 μs to 10 s line to pin 9 of U587C. This signal is coupled to pin 7 of U497B, and is transferred to pin 10 of U500B, which in turn is coupled to pins 1 and 13 of U590. This signal path both starts and stops the GATE in FREQUENCY A.

Manual GATE operation is used in TOTALIZE A operated through the front panel switch to pin 10 of U590B for that function only.

Phase Lock Loop

The Phase Lock Loop is used to generate higher frequencies from one stable low-frequency source. Basically, the phase detector compares the phase of two 1 MHz signals. The first is generated by the internal clock; the second is the output of the 100 MHz voltage controlled oscillator (VCO), divided by 100. If the two signals differ in phase, an error voltage is generated and applied across a varactor diode to the VCO. This corrects the output of the VCO in the direction required for decreasing the phase difference until lock is achieved, at which time the VCO will continue to track the internal clock signal.

The output, pin 3 of U875, of the voltage controlled oscillator is a 100 MHz signal, which is first divided by 10 through U835 and U845. The second divide by 10 in U855 produces a 1 MHz signal at its output, pin 8, which is fed to pin 3 of the Phase Detector, U856. The internal clock supplies a 1 MHz reference signal to pin 1 of U856A. Loop lock-up occurs when the negative transitions of both the reference input at pin 1 and the feedback input at pin 3 coincide. If the input signal at pin 3 lags or leads the reference signal at pin 1, the phase detector, U856, generates an error voltage through the filter/amplifier (FET follower Q865A and amplifier, pin 9 to pin 8 of U856C) that is proportional to the phase difference of the input signals. This voltage is applied to the cathode of the varactor diode, (CR870) in the tank circuit, providing a voltage variable input. The variable capacitance of the varactor produces a frequency change correcting the 100 MHz voltage controlled oscillator (VCO) output.

COUNTERS, DISPLAY MULTIPLEXING, TIME BASE AND PARAMETER SELECTION

10^0-10^6 Decade Counting Units (DCU) And Display Latches

The 10^0 to 10^6 DCU are cascaded divide by 10 counters. The count is transferred to a storage register, which displays the results, leaving the counting circuits free to make new measurements. The display accumulates data coming into Channel A when measuring FREQUENCY A, RATIO A/B, EVENTS A DURING B, or TOTALIZE A. It accumulates CLOCK RATE pulses when measuring PERIOD B, TIME A→B, and WIDTH B.

The GATE control circuit drives the 10^0 decade counting unit (DCU). It also includes an arming mechanism,

which is necessary in statistical averaging for time interval measurement. The GATE arming for display accumulation is U342, a very fast D-type edge-triggered ECL device. The first decade counter (10^0) located on the Trigger circuit board is composed of U350 which divides by 2, and a ring counter, U355A, U355B and U360B, which divides by 5. The outputs are not BCD coded on this circuit board. The 10^0 DCU supplies four lines via interconnecting cable to the Main Board. These are decoded from ECL to TTL levels by four transistors, Q640, Q655, Q660 and Q670, which in turn drive U655 and U657 gates to derive a BCD code for the first display latch, U652. This storage register provides the least significant digit (LSD), which is the first digit on the right in the display. The signal on the fourth line (24) is converted to a TTL level and transferred into pin 14 of U675 to advance the next decade counting unit (10^1 DCU). Its corresponding storage register is U676. The 10^2 DCU, U678 is latched by U679. The rest of the display dividing and subsequent latching and displaying takes place in U600, a P-channel MOS four-decade synchronous counter. The signal from pin 11 of U678 is transferred to U700 through transistor, Q680, which creates 1 μs pulses that are required for compatibility with the MOS IC, U700.

To ensure that the MOS divider, U700, accumulates and displays information properly, inputs to pins 5, 6 and 7 must arrive with a special timing and sequence. A negative edge at the Count Input (pin 7) must follow a Transfer Input signal (pin 5) by at least 1 μs. A Reset Input (pin 6) must follow this Count Input by at least 1 μs. This prevents transfer of invalid data.

Negative-edge transition at the Count Input (pin 7) increment the counter. For correct operation of 250 kHz maximum frequency into J700, the waveform at pin 7 must be low for 1 μs and high for 3 μs for a total of 4 μs. Transistor Q680 and its associated circuitry modify the signal from pin 11 of U678 to provide the maximum count rate.

When the Transfer Input (pin 5) is low, data in the decade counters is transferred to the internal storage latches. The signal into pin 5 must be at least 2.5 μs in duration. Two stretchers provide 10 μs and 100 μs extended latch pulses. The 10 μs latch pulse is supplied to pin 5 of U700 by pin 11 of U625D. At least 1 μs after a latch into pin 5 (the Transfer Input) and at least 1 μs prior to a Reset signal into pin 6, an extra pulse into pin 7 (Count Input) is required. Transistor Q690 which responds to the end of the latch edge into pin 5 (Transfer Input), provides the one additional delayed Count Input to pin 7 before the Reset pulse. Thus, when the Transfer Input (pin 5) goes high and the next negative transition at the Count Input (pin 7) occurs, the Transfer command is terminated.

The 100 μs stretcher (which holds off the Reset), generated by the MOS Interfacing Circuitry, proceeds from pin 4 of U630B. The Reset signal couples across U620A to pin 6 of U700. The resetting at pin 6 of U700 guarantees that, 1) the BCD information sent to the display from pins 10 through 13 of U700 will start at the Most Significant Digit (MSD), and 2) the display dividers in U700 are set to zeros. Resetting of U700 occurs only when Time Slots 1 through 4 are not being displayed. When the output information from U700 is being displayed, pin 1 of U620A is held low which disables the signal from pin 3 of U620A into pin 6 of U700. Resetting via pin 3 of U620A is also disabled when the GATE is open, via the LATCH and $\overline{\text{CLEAR}}$ signals to pin 12 of U620D and pin 3 of U610A, respectively.

The signal at pin 2 of U620A, shaped by RC network R632 and C632, resets the 10^0, 10^1, and 10^2 DCU's. The shaped signal transmitted to pin 2 of both U675 (10^1) and U678 (10^2) is also transferred to the Trigger Circuit Board to reset the 10^0 DCU.

Time Slot Generator

Time Slot generation is derived from the scan clock, U715C and U650F, which operate as an oscillator. The binary outputs from the divide by 8 counter, three cascaded divide by two devices U750A, U750B and U720B, are transferred to serial information in U755, the Time Slot Decoder. U755 provides 8 output lines or time slots.

U700, the MOS four-decade counter with latches and multiplexing circuitry, generates the four most significant digit information displayed by the first four time slots (1 through 4). The Scan Input (pin 9) drives the internal counter, routing one decade count at a time to the outputs. The decoders are scanned from MSD (most significant digit) to LSD (least significant digit). The second set of four time slots display the remaining three digits (5, 6 and 7) and a time slot 0 (used for referencing) which is not displayed. The three digits, 5, 6 and 7, are derived from the discrete latches, U652, U676 and U679 respectively.

The first four pulses coupled through U715B and U650A into pin 9 of U700 advance the BCD outputs from MSD to LSD. A grounded emitter transistor, Q704, is turned on when the first four time slots are activated, enabling the transistors that are driven from the outputs of U700. (Output pin 10 drives Q703 and pins 11, 12 and 13 drive Q702, Q701 and Q700 in that order.) The divide by 8 counter (U750A, U750B and U720B) causes a high for four counts, which transmits the first four pulses (1 through 4) into pin 9 of U700. The next 4 counts (5, 6, 7 and 0) present a low at pin 9 and no pulses are received. Thus, during time slots 5, 6, 7 and 0, the latched BCD information from U652, U676 and U679 can be displayed, since Q704 is turned off.

Overflow Indication Circuit

When the decade counters have counted to 9,999,999, the counters are full. At the next count, the signal from U700 (pin 8) coupled across transistor Q718 is the clock input for U720A (pin 3). The signal is transferred across U720A and U610B producing a high at pin 8 turning off diodes CR726 and CR725. This supplies a high at the input of U715A which starts the multivibrator causing the LED display to flash.

Time Base And Clock Rate Divider

A precise one-megahertz clock provides the reference for operation of the gate-generating and time-counting circuits. The output of crystal oscillator Y900 is adjustable by C905 to one megahertz. The four parts of U900 form a shaper-buffer stage to produce square-wave clock pulses and to isolate the oscillator from the 1 MHz output line.

Optional 1 MHz Clock

An optional 1 MHz clock is available, using a very stable 5 MHz crystal oscillator and a divide-by-five counter. This combination is shown on the schematic as Y901 and U901.

Time Base

The time base integrated circuit U895 operates at 1 MHz as determined by the signal supplied by the 1 MHz clock and buffer circuitry to the external input (pin 3). If an external clock is to be used, then the internally located Oscillator Int/Ext switch S900 is set to EXT and the external clock signal is connected to pin 14A of the plug-in connector. The 1 MHz oscillator signal is decade divided by U895 to produce the 1 μs to 10 μs output selected from the CLOCK RATE switch or the GATE signal for the counter. The division factor for the GATE signal is selected by placing the appropriate voltage levels on pins 12 through 14 of U895.

U895 dividers for the GATE control are reset to all nines for FREQUENCY A operation, after the GATE signal has occurred, by applying a positive level to pin 6 of U895. This reset allows the counting cycle to restart immediately following a manual RESET or a clear pulse. If the U895 dividers were not reset to all nines, the delay before the next count could begin would be equivalent to one gate-time interval.

The output from pin 1 of U895 is synchronized with the driving 1 MHz standard through U765B to reduce the jitter of U895. The 1 μs to 10 μs output (pin 9 of U765B) proceeds to the CLOCK RATE selection circuitry.

Decimal Point And Parameter Selection

Time Interval Modes. When the FUNCTION switch is set to any of the time interval measurement settings, PERIOD B, TIME A→B, or WIDTH B, the proper display of decimal point and parameter light selection is determined by a transistor matrix. U922B, U922A, and U920A, B, C and D are the TTL gates used in interfacing to the transistor matrix. The emitters of the transistors in the matrix define one axis along which the averaging factor is transmitted. The bases of the transistors constitute the axis that determine the CLOCK RATE selection. The resultant combination is diagonally cross-coupled collectors. Certain combinations of decimal points and parameters are common. The XYZ transistor matrix turns on these combinations through diode pairs. Table 1-3 in the Operating Instructions section describes which decimal points and parameters are turned on for the different combinations of CLOCK RATE and averaging factor (N).

Troubleshooting Aid

The Main circuit board has been designed so that the transistor matrix can be used as a troubleshooting aid. For example, if the N (averaging) Switch (S950) is set at 10^3 (3) and the CLOCK RATE switch (S895) to 1 μs, then according to Table 1-3, the decimal point appearing in the readout display should be placed at the .000 position. The μs units indicator light should be on.

If the decimal point or correct parameter light does not function because of a faulty transistor, it can be found very easily. Find the N (averaging) Switch (S950) logic diagram on the schematic for the Main circuit board. Start at the 10^3 (3) line and trace back along the signal path. Note that the signal is derived from column 3 of the transistor matrix.

The signal paths from the TTL interfacing gates to the transistor matrix are marked with the same units as the front panel CLOCK RATE switch. Observe that the fourth row down is marked 1 μs, indicating that the transistor controlling the correct parameter light and decimal point is in the 4th row.

Therefore, the faulty transistor is at the intersection of the 3rd column and 4th row. Orient the DC 505A so that the nomenclature etched on the circuit board can be read correctly. The transistors are laid out on the circuit board the same way as the the schematic (and Table 1-3) is drawn.

Frequency Mode. With the FUNCTION switch set to any of the FREQUENCY A positions, the decimal point placement and parameter lights are controlled by U925A, B, C and D.

RATIO A/B, EVENTS A DURING B MODES. Five transistors, Q975, Q978, Q981, Q984 and Q987 control decimal point and parameter selection from the N (averaging) Switch for RATIO A/B and EVENTS A DURING B settings of the FUNCTION switch. There is no parameter or decimal point placement in TOTALIZE A mode.

DISPLAY AND POWER SUPPLIES

Seven-Segment Decoder And Driver, Display And Parameter LED's

U780 is a BCD-to-seven-segment decoder. It accepts the BCD output of the latches, then allows pull down current to the appropriate cathodes of the enabled LED's to display the correct number. The display LED's are DS820, DS815, DS810, DS806, DS800, DS796 and DS790. When looking at the front panel, DS820 controls the numerical digit displayed at the far left. Each LED unit has seven segments, arranged so that a combination of lighted segments forms a number. When all of the segments are lighted, an "8" is formed.

Leading Zero Suppression

Decoder driver U780 also has a zero-blanking feature that allows suppression of the zeros leading the most significant digit (MSD) in the display. At the non-displayed, referencing time slot, TS-0, a low is applied to the direct-clear input, pin 1, of U765A, the zero-suppression storage register. This sets U765A to the zero-suppress state (high at pin 6), allowing the Ripple-Blanking Input (RBI, pin 5) of U780 to be low. When the output of U755 resets to the MSD (TS-1), the RBI of U780, remains low for a few nanoseconds due to propagation delays, which allows the first digit to arrive from the latches while RBI is low. If this first digit being decoded is a zero, the output to the display LED will be inhibited and the Ripple-Blanking Output (RBO, pin 4) will be low. If the digit is not a zero, the outputs are enabled and RBO goes high. The RBO is applied to pin 2 input of U765A and is transferred to the output when the next scan-clock transition occurs. Thus if the first digit is a zero, pin 5 of U780 is held low, inhibiting the output until the first non-zero digit comes through the decoder. when the first non-zero digit arrives, the outputs of U780 are enabled and the digit is displayed. Also, the RBO output at pin 4 is set high, removing the RBI from pin 5 and allowing all succeeding digits to be displayed through the TS-7 sequence.

When the scan gets past a decimal point in the display, or if the display overflows, any zeros arriving at the decoder are displayed. The last digit (LSD) to the right is always displayed as follows: TS-7 is applied through negative output NOR gate U625C. It is then applied to the direct-set input of U765A as a low. This holds pin 5 of U780 high, preventing zero-blanking during the TS-7 time slot.

The location of the decimal point in the display is determined by the FUNCTION, CLOCK RATE, and N (averaging) Switches. The proper information is applied via the decimal logic to NAND gates U760A, B, C and D. Time slot lines TS-3 through TS-6 enable these NAND gates in sequence, setting U765A to the non-blank state at the appropriate time. In the case where the counter overflows, the high output from U610B or Q725 is applied to pin 11 of U630E setting pin 4 of U765A to the non-blank state.

When the front-panel RESET button is pushed, $\overline{\text{RESET}}$ goes low, overriding the output of U765A, applying the non-blank and lamp-test functions to the decoder. This causes all seven segments in the display LED's to be turned on.

The reset circuitry provides an automatic reset by grounding the $\overline{\text{RESET}}$ line for a short time after instrument turn-on. The FUNCTION switch also provides a method of automatic reset by grounding the $\overline{\text{RESET}}$ line between switch detent positions. The automatic reset ensures that the readout has been cleared before the next measurement. The automatic reset can be seen by noting that the display goes to all eights (all LED segments lit) in between switch detent positons.

Regulated Power Supplies

Operating power is obtained from the power module mainframe, then rectified, filtered and regulated to provide stable supplies of +15 volts, +5 volts, and −10 volts. The +15 volt supply, whose active device is U10, provides the reference for the remaining supplies. Its output is set to exactly +15 volts by adjustment of R17.

Integrated circuit U30 regulates the +5 volt supply, and transistors Q65, Q68 and Q80 regulate the −10 volt supply. The series-pass transistors for these supplies are located in the mainframe, where they can be provided the proper heat dissipation.

REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000	Part first added at this serial number
00X	Part removed after this serial number

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

ACTR	ACTUATOR	PLSTC	PLASTIC
ASSY	ASSEMBLY	QTZ	QUARTZ
CAP	CAPACITOR	RECP	RECEPTACLE
CER	CERAMIC	RES	RESISTOR
CKT	CIRCUIT	RF	RADIO FREQUENCY
COMP	COMPOSITION	SEL	SELECTED
CONN	CONNECTOR	SEMICOND	SEMICONDUCTOR
ELCTLT	ELECTROLYTIC	SENS	SENSITIVE
ELEC	ELECTRICAL	VAR	VARIABLE
INCAND	INCANDESCENT	WW	WIREWOUND
LED	LIGHT EMITTING DIODE	XFMR	TRANSFORMER
NONWIR	NON WIREWOUND	XTAL	CRYSTAL

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
00853	SANGAMO ELECTRIC CO., S. CAROLINA DIV.	P O BOX 128	PICKENS, SC 29671
01121	ALLEN-BRADLEY COMPANY	1201 2ND STREET SOUTH	MILWAUKEE, WI 53204
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
04222	AVX CERAMICS, DIVISION OF AVX CORP.	P O BOX 867, 19TH AVE. SOUTH	MURTLE BEACH, SC 29577
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD,PO BOX 20923	PHOENIX, AZ 85036
05091	TRI-ORDINATE CORPORATION	343 SNYDER AVENUE	BERKELEY HEIGHTS, NJ 07922
05397	UNION CARBIDE CORPORATION, MATERIALS SYSTEMS DIVISION	11901 MADISON AVENUE	CLEVELAND, OH 44101
07263	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS STREET	MOUNTAIN VIEW, CA 94042
07910	TELEDYNE SEMICONDUCTOR	12515 CHADRON AVE.	HAWTHORNE, CA 90250
08806	GENERAL ELECTRIC CO., MINIATURE LAMP PRODUCTS DEPARTMENT	NELA PARK	CLEVELAND, OH 44112
10389	CHICAGO SWITCH, INC.	2035 WABANSIA AVE.	CHICAGO, IL 60647
27014	NATIONAL SEMICONDUCTOR CORP.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
34553	AMPEREX ELECTRONIC CORP., COMPONENT DIV.	35 HOFFMAN AVE.	HAPPAUGE, NY 11787
50088	MOSTEK CORP.	1400 UPFIELD DR.	CARROLLTON, TX 75006
50347	OPCOA, DIVISION OF IDS	330 TALMADGE ROAD	EDISON, NJ 08817
50579	LITRONIX INC.	19000 HOMESTEAD RD.	CUPERTINO, CA 95014
56289	SPRAGUE ELECTRIC CO.		NORTH ADAMS, MA 01247
71034	BLILEY ELECTRIC CO.	2545 W. GRANDVIEW BLVD.	ERIE, PA 16512
71400	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
73138	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	2500 HARBOR BLVD.	FULLERTON. CA 92634
74970	JOHNSON, E. F., CO.	299 10TH AVE. S. W.	WASECA, MN 56093
75042	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	401 N. BROAD ST.	PHILADELPHIA, PA 19108
79727	C-W INDUSTRIES	550 DAVISVILLE RD.,P O BOX 96	WARMINISTER, PA 18974
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
81483	INTERNATIONAL RECTIFIER CORP.	9220 SUNSET BLVD.	LOS ANGELES, CA 90069
90201	MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY AND CO., INC.	3029 E WASHINGTON STREET P O BOX 372	INDIANAPOLIS, IN 46206
91418	RADIO MATERIALS COMPANY, DIV. OF P.R. MALLORY AND COMPANY, INC.	4242 W BRYN MAWR	CHICAGO, IL 60646
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NE 68601
98291	SEALECTRO CORP.	225 HOYT	MAMARONECK, NY 10544

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A1[1]	670-4225-00	B010100	B010299	CKT BOARD ASSY:MAIN	80009	670-4225-00
A1[1]	670-4225-01	B010300	B010629	CKT BOARD ASSY:MAIN	80009	670-4225-01
A1[1]	670-4225-02	B010630	B010949	CKT BOARD ASSY:MAIN	80009	670-4225-02
A1[1]	670-4225-03	B010950		CKT BOARD ASSY:MAIN	80009	670-4225-03
A1[2]	670-4225-00	B010100	B010298	CKT BOARD ASSY:MAIN	80009	670-4225-00
A1[2]	670-4225-01	B010299	B010659	CKT BOARD ASSY:MAIN	80009	670-4225-01
A1[2]	670-4225-02	B010660	B010773	CKT BOARD ASSY:MAIN	80009	670-4225-02
A1[2]	670-4225-03	B010774		CKT BOARD ASSY:MAIN	80009	670-4225-03
A1[3]	670-4229-00	B010100	B010329	CKT BOARD ASSY:MAIN	80009	670-4229-00
A1[3]	670-4229-01	B010330	B010659	CKT BOARD ASSY:MAIN	80009	670-4229-01
A1[3]	670-4229-02	B010660	B010773	CKT BOARD ASSY:MAIN	80009	670-4229-02
A1[3]	670-4229-03	B010774		CKT BOARD ASSY:MAIN	80009	670-4229-03
A2[1]	670-4226-00	B010100	B010299	CKT BOARD ASSY:TRIGGER	80009	670-4226-00
A2[1]	670-4226-01	B010300	B010949	CKT BOARD ASSY:TRIGGER	80009	670-4226-01
A2[1]	670-4226-02	B010950	B011059	CKT BOARD ASSY:TRIGGER	80009	670-4226-02
A2[1]	670-4226-03	B011060		CKT BOARD ASSY:TRIGGER	80009	670-4226-03
A2[3]	670-4226-00	B010100	B010329	CKT BOARD ASSY:TRIGGER	80009	670-4226-00
A2[3]	670-4226-01	B010330	B010969	CKT BOARD ASSY:TRIGGER	80009	670-4226-01
A2[3]	670-4226-02	B010970	B011079	CKT BOARD ASSY:TRIGGER	80009	670-4226-02
A2[3]	670-4226-03	B011080		CKT BOARD ASSY:TRIGGER	80009	670-4226-03
A2[2]	670-4226-00	B010100	B010297	CKT BOARD ASSY:TRIGGER	80009	670-4226-00
A2[2]	670-4226-01	B010298	B010773	CKT BOARD ASSY:TRIGGER	80009	670-4226-01
A2[2]	670-4226-02	B010774	B011144	CKT BOARD ASSY:TRIGGER	80009	670-4226-02
A2[2]	670-4226-03	B011145		CKT BOARD ASSY:TRIGGER	80009	670-4226-03
A3[1]	670-2888-00	B010100	B010879	CKT BOARD ASSY:DISPLAY	80009	670-2888-00
A3[1]	670-2888-01	B010880		CKT BOARD ASSY:DISPLAY	80009	670-2888-01
A3[3]	670-2888-00	B010100	B010929	CKT BOARD ASSY:DISPLAY	80009	670-2888-00
A3[3]	670-2888-01	B010930		CKT BOARD ASSY:DISPLAY	80009	670-2888-01
A4	670-4227-00			CKT BOARD ASSY:LEVEL OUT	80009	670-4227-00
A5[1]	670-5082-00	XB010950		CKT BOARD ASSY:REGULATOR	80009	670-5082-00
A5[3]	670-5082-00	XB010970		CKT BOARD ASSY:REGULATOR	80009	670-5082-00
A5[2]	670-5082-00	XB010774		CKT BOARD ASSY:REGULATOR	80009	670-5082-00
C17	281-0523-00			CAP.,FXD,CER DI:100PF,+/-20PF,500V	72982	301-000U2M0101M
C20	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	05397	T368C476M020AZ
C25	290-0687-00			CAP.,FXD,ELCTLT:5000UF,+75/-10%,10V	56289	39D630
C26	290-0687-00			CAP.,FXD,ELCTLT:5000UF,+75/-10%,10V	56289	39D630
C35	281-0623-00			CAP.,FXD,CER DI:650PF,5%,500V	04222	7001-1362
C40	290-0529-00			CAP.,FXD,ELCTLT:47UF,20%,20V	05397	T368C476M020AZ
C50	290-0662-00			CAP.,FXD,ELCTLT:220UF,20%,10V	90201	TDC227M010DL
C55	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
C60	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020FL
C65	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C75	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C80[1]	281-0523-00	B010100	B010949X	CAP.,FXD,CER DI:100PF,+/-20PF,500V	72982	301-000U2M0101M
C80[3]	281-0523-00	B010100	B010969X	CAP.,FXD,CER DI:100PF,+/-20PF,500V	72982	301-000U2M0101M
C80[2]	281-0523-00	B010100	B010773X	CAP.,FXD,CER DI:100PF,+/-20PF,500V	72982	301-000U2M0101M
C81[1]	283-0177-00	XB010950		CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C81[3]	283-0177-00	XB010970		CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C81[2]	283-0177-00	XB010774		CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C104	283-0006-00			CAP.,FXD,CER DI:0.02UF,+80-20%,500V	72982	841-541E203Z
C110	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V	72982	301-055C0G0100F
C112	281-0517-00			CAP.,FXD,CER DI:39PF,+/-3.9PF,500V	72982	308-000C0G0390K

[1]Standard only
[2]Option 4 only
[3]Option 1 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C122	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C125	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C127	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C135	281-0184-00			CAP.,VAR,PLSTC:2-18PF,500VDC	34553	2222-809-05003
C136	281-0564-00			CAP.,FXD,CER DI:24PF,5%,500V	72982	301-000C0G0240J
C158	290-0535-00			CAP.,FXD,ELCTLT:33UF,20%,10V	56289	196D336X0010KA1
C160	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C180	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C185	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C190	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C194	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C195	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C200	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C214	283-0006-00			CAP.,FXD,CER DI:0.02UF,+80-20%,500V	72982	841-541E203Z
C220	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V	72982	301-055C0G0100F
C222	281-0517-00			CAP.,FXD,CER DI:39PF,+/-3.9PF,500V	72982	308-000C0G0390K
C232	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C235	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C245	281-0184-00			CAP.,VAR,PLSTC:2-18PF,500VDC	34553	2222-809-05003
C246	281-0564-00			CAP.,FXD,CER DI:24PF,5%,500V	72982	301-000C0G0240J
C268	290-0535-00			CAP.,FXD,ELCTLT:33UF,20%,10V	56289	196D336X0010KA1
C270	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C290	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C295	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C330	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C342	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C345	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C350	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C372	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C384	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C388	281-0605-00			CAP.,FXD,CER DI:200PF,10%,500V	04222	7001-1375
C390	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C395	281-0638-00			CAP.,FXD,CER DI:240PF,5%,500V	72982	301000Z5D241J
C400	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C403[1]	283-0003-00	XB011060		CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C403[2]	283-0003-00	XB011080		CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C403[3]	283-0003-00	XB011145		CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C425	281-0605-00			CAP.,FXD,CER DI:200PF,10%,500V	04222	7001-1375
C485	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C490[1]	283-0660-00	B010100	B011059	CAP.,FXD,MICA D:510PF,2%,500V	00853	D155F511G0
C490[1]	283-0672-00	B011080		CAP.,FXD,MICA D:200PF,1%,500V	00853	D155F201F0
C490[2]	283-0660-00	B010100	B011079	CAP.,FXD,MICA D:510PF,2%,500V	00853	D155F511G0
C490[2]	283-0672-00	B011080		CAP.,FXD,MICA D:200PF,1%,500V	00853	D155F201F0
C490[3]	283-0660-00	B010100	B011144	CAP.,FXD,MICA D:510PF,2%,500V	00853	D155F511G0
C490[3]	283-0672-00	B011145		CAP.,FXD,MICA D:200PF,1%,500V	00853	D155F201F0
C515	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C526	283-0641-00			CAP.,FXD,MICA D:180PF,1%,100V	00853	D151E181F0
C532	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C537	281-0628-00			CAP.,FXD,CER DI:15PF,5%,500V	72982	301-000C0G0150J
C540	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C543	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C545	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C560	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z

[1]Standard only
[2]Option 1 only
[3]Option 4 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C562	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C565	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C598	283-0198-00			CAP.,FXD,CER DI:0.22UF,20%,50V	72982	8131N075 E224M
C620	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C625	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C630	283-0198-00			CAP.,FXD,CER DI:0.22UF,20%,50V	72982	8131N075 E224M
C632	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C664	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C666	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C668	281-0637-00			CAP.,FXD,CER DI:91PF,5%,500V	72982	301000Z5D910J
C680	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C681	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C684	283-0047-00			CAP.,FXD,CER DI:270PF,5%,500V	72982	861-518B271J
C685	281-0549-00			CAP.,FXD,CER DI:68PF,10%,500V	72982	301-000U2J0680K
C690	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C692	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C697	283-0028-00			CAP.,FXD,CER DI:0.0022UF,20%,50V	56289	19C606
C710	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C722	283-0341-00			CAP.,FXD,CER DI:0.047UF,10%,100V	72982	8131N127X7R0473K
C730	290-0535-00			CAP.,FXD,ELCTLT:33UF,20%,10V	56289	196D336X0010KA1
C732	290-0535-00			CAP.,FXD,ELCTLT:33UF,20%,10V	56289	196D336X0010KA1
C744	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C746	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
C755	283-0058-00			CAP.,FXD,CER DI:0.027UF,10%,100V	72982	8131N147W5R273K
C757	281-0523-00			CAP.,FXD,CER DI:100PF,+/-20PF,500V	72982	301-000U2M0101M
C863	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,12V	91418	MX104Z1201R0
C865	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C866	281-0524-00			CAP.,FXD,CER DI:150PF,+/-30PF,500V	04222	7001-1381
C870	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C872	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C875	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-558Z5U-103Z
C891[1]	281-0519-00			CAP.,FXD,CER DI:47PF,+/-4.7PF,500V	72982	308-000C0G0470K
C904[1]	281-0739-00			CAP.,FXD,CER DI:18PF,5%,500V	72982	301-000T2H180J
C905[1]	281-0166-00			CAP.,VAR,AIR DI:1.9-15.7PF,250V	74970	187-0109-005
C906[1]	281-0504-00			CAP.,FXD,CER DI:10PF,+/-1PF,500V	72982	301-055C0G0100F
CR25	152-0198-00			SEMICOND DEVICE:SILICON,200V,3A	04713	1N4721
CR26	152-0198-00			SEMICOND DEVICE:SILICON,200V,3A	04713	1N4721
CR67	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR68	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR122	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR154	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR165	152-0153-00			SEMICOND DEVICE:SILICON,15V,50MA	80009	152-0153-00
CR185	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR195	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR232	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR264	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR275	152-0153-00			SEMICOND DEVICE:SILICON,15V,50MA	80009	152-0153-00
CR295	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR320	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR330	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR332	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR384	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152

[1]Standard only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CR403[1]	152-0141-02	XB011060		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR403[2]	152-0141-02	XB011080		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR403[3]	152-0141-02	XB011145		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR435	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR440	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR445	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR450	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR455	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR458[1]	152-0141-02	XB011060		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR458[2]	152-0141-02	XB011080		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR458[3]	152-0141-02	XB011145		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR460	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR494	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR495[1]	152-0141-02	XB011060		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR495[2]	152-0141-02	XB111080		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR495[3]	152-0141-02	XB011145		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR512	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR513	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR515	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR545	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR554	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR555	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR570	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR580	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR587	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR588	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR595	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR610	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR612	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR614	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR615	152-0008-00			SEMICOND DEVICE:GERMANIUM,75V,60MA	80009	152-0008-00
CR625	152-0008-00			SEMICOND DEVICE:GERMANIUM,75V,60MA	80009	152-0008-00
CR630	152-0008-00			SEMICOND DEVICE:GERMANIUM,75V,60MA	80009	152-0008-00
CR646	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR647	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR680	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR684	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR685	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR690	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR692	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR697	152-0008-00			SEMICOND DEVICE:GERMANIUM,75V,60MA	80009	152-0008-00
CR725	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR726	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR850	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR870	152-0269-00			SEMICOND DEVICE:SILICON,VAR VCAP.,4V,33PF	80009	152-0269-00
CR875	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR876	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR895	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR896	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR912	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR914	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR935	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR936	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152

[1]Standard only
[2]Option 1 only
[3]Option 4 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CR937	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR940	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR941	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR942	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR943	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR944	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR946	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR947	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR948	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR950	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR951	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR952	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR954	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR955	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR957	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR958	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR960	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR961	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR963	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR964	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR966	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR967	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR969	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR970	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR972	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR973	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR975	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR976	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR978	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
DS790[1]	150-1002-00	B010100	B010879X	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS790[2]	150-1002-00	B010100	B010929X	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS796[1]	150-1002-00	B010100	B010879X	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS796[2]	150-1002-00	B010100	B010929X	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS797[1]	150-1024-00	XB010880		LAMP,LED DSPL:2 DIGIT,7 SEGMENT,RED	50579	DL882A
DS797[2]	150-1024-00	XB010930		LAMP,LED DSPL:2 DIGIT,7 SEGMENT,RED	50579	DL882A
DS800[1]	150-1002-00	B010100	B010879X	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS800[2]	150-1002-00	B010100	B010929X	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS806[1]	150-1002-00	B010100	B010879X	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS806[2]	150-1002-00	B010100	B010929X	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS810[1]	150-1002-00	B010100	B010879	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS810[1]	150-1025-00	B010880		LAMP,LED,DSPL:3 DIGIT,7 SEGMENT,RED	50579	DL883A
DS810[2]	150-1002-00	B010100	B010929	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS810[2]	150-1025-00	B010930		LAMP,LED,DSPL:3 DIGIT,7 SEGMENT,RED	50579	DL883A
DS815[1]	150-1002-00	B010100	B010879X	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS815[2]	150-1002-00	B010100	B010929X	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS820[1]	150-1002-00	B010100	B010879	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS820[1]	150-1024-00	B010880		LAMP,LED DSPL:2 DIGIT,7 SEGMENT,RED	50579	DL882A
DS820[2]	150-1002-00	B010100	B010929	LAMP,LED RDOUT:NUMERICAL DISPLAY	50579	DL8L
DS820[2]	150-1024-00	B010930		LAMP,LED DSPL:2 DIGIT,7 SEGMENT,RED	50579	DL882A
DS825[1]	150-1004-00	B010100	B010879	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS825[1]	150-1040-00	B010880		LAMP,LED:RED,5MA,2.0V	50347	LLL-7A
DS825[2]	150-1004-00	B010100	B010929	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS825[2]	150-1040-00	B010930		LAMP,LED:RED,5MA,2.0V	50347	LLL-7A

[1]Standard only
[2]Option 1 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
DS826[1]	150-1004-00	B010100	B010879	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS826[1]	150-1040-00	B010880		LAMP,LED:RED,5MA,2.0V	50347	LLL-7A
DS826[2]	150-1004-00	B010100	B010829	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS826[2]	150-1040-00	B010830		LAMP,LED:RED,5MA,2.0V	50347	LLL-7A
DS827[1]	150-1004-00	B010100	B010879	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS827[1]	150-1040-00	B010881		LAMP,LED:RED,5MA,2.0V	50347	LLL-7A
DS827[2]	150-1004-00	B010100	B010829	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS827[2]	150-1040-00	B010830		LAMP,LED:RED,5MA,2.0V	50347	LLL-7A
DS828[1]	150-1004-00	B010100	B010879	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS828[1]	150-1040-00	B010880		LAMP,LED:RED,5MA,2.0V	50347	LLL-7A
DS828[2]	150-1004-00	B010100	B010829	LAMP,LED:RED,2.5V,15MA	08806	SSL-12
DS828[2]	150-1040-00	B010830		LAMP,LED:RED,5MA,2.0V	50347	LLL-7A
F25	159-0017-00			FUSE,CARTRIDGE:3AG,4A,250V,FAST BLOW	71400	MTH4
J100	131-0955-00			CONNECTOR,RCPT,:BNC,FEMALE,W/HARDWARE	05091	31-279
J205	131-0938-00			CONNECTOR,RCPT,:50 OHM MALE SNAP-ON	98291	051-043-0349
J210	131-0955-00			CONNECTOR,RCPT,:BNC,FEMALE,W/HARDWARE	05091	31-279
J310	131-0938-00			CONNECTOR,RCPT,:50 OHM MALE SNAP-ON	98291	051-043-0349
L25	108-0551-00			COIL,RF:14UH	80009	108-0551-00
L50	108-0337-00			COIL,RF:25UH	80009	108-0337-00
L55	108-0422-00			COIL,RF:80UH	80009	108-0422-00
L185	108-0181-01			COIL,RF:0.2UH	80009	108-0181-01
L295	108-0181-01			COIL,RF:0.2UH	80009	108-0181-01
L332	108-0509-00			COIL,RF:2.5UH	80009	108-0509-00
L870	108-0420-00			COIL,RF:60NH	80009	108-0420-00
Q10[1]	151-0334-00	XB010950		TRANSISTOR:SILICON,NPN	80009	151-0334-00
Q10[2]	151-0334-00	XB010970		TRANSISTOR:SILICON,NPN	80009	151-0334-00
Q10[3]	151-0334-00	XB010774		TRANSISTOR:SILICON,NPN	80009	151-0334-00
Q30[1]	151-0334-00	XB010950		TRANSISTOR:SILICON,NPN	80009	151-0334-00
Q30[2]	151-0334-00	XB010970		TRANSISTOR:SILICON,NPN	80009	151-0334-00
Q30[3]	151-0334-00	XB010774		TRANSISTOR:SILICON,NPN	80009	151-0334-00
Q42	151-0515-01			TRANSISTOR:50V,8A	04713	2N4441
Q65	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q68	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q80	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q125A,B	151-1042-00			SEMICOND DVC SE:MATCHED PAIR FET	80009	151-1042-00
Q130	151-0438-00			TRANSISTOR:SILICON,PNP,SEL FROM SPS6927	80009	151-0438-00
Q132	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00
Q160	151-0438-00			TRANSISTOR:SILICON,PNP,SEL FROM SPS6927	80009	151-0438-00
Q165	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00
Q170	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00
Q172	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00
Q195	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q235A,B	151-1042-00			SEMICOND DVC SE:MATCHED PAIR FET	80009	151-1042-00
Q240	151-0438-00			TRANSISTOR:SILICON,PNP,SEL FROM SPS6927	80009	151-0438-00
Q242	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00
Q270	151-0438-00			TRANSISTOR:SILICON,PNP,SEL FROM SPS6927	80009	151-0438-00
Q275	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00
Q280	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00
Q282	151-0427-00			TRANSISTOR:SILICON,NPN	80009	151-0427-00
Q330	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q385	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00

[1]Standard only
[2]Option 1 only
[3]Option 4 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q420	151-0220-00			TRANSISTOR:SILICON,PNP	80009	151-0220-00
Q430	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q435	151-0220-00			TRANSISTOR:SILICON,PNP	80009	151-0220-00
Q440	151-0220-00			TRANSISTOR:SILICON,PNP	80009	151-0220-00
Q445	151-0220-00			TRANSISTOR:SILICON,PNP	80009	151-0220-00
Q450	151-0220-00			TRANSISTOR:SILICON,PNP	80009	151-0220-00
Q455	151-0220-00			TRANSISTOR:SILICON,PNP	80009	151-0220-00
Q480	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q485[1]	151-0504-00	B010100	B010879	TRANSISTOR:SILICON,N-CHAN,UNIJUNCTION	04713	2N4851
Q485[1]	151-0504-01	B010880		TRANSISTOR:SILICON,N-CHAN,UNIJUNCTION	04713	SU309
Q485[2]	151-0504-00	B010100	B010929	TRANSISTOR:SILICON,N-CHAN,UNIJUNCTION	04713	2N4851
Q485[2]	151-0504-01	B010930		TRANSISTOR:SILICON,N-CHAN,UNIJUNCTION	04713	SU309
Q490	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q506	151-0367-00			TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	80009	151-0367-00
Q515	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q535	151-0220-00			TRANSISTOR:SILICON,PNP	80009	151-0220-00
Q540	151-0503-00			TRANSISTOR:SCR,30V,0.8A	04713	2N5060
Q550	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q565	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q570	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q575	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q595	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q598	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q615	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q640	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q655	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q660	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q670	151-0438-00			TRANSISTOR:SILICON,PNP,SEL FROM SPS6927	80009	151-0438-00
Q680	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q690	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q700	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q701	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q702	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q703	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q704	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q718	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q725	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q790	151-0301-00			TRANSISTOR:SILICON,PNP	04713	2N2907A
Q796	151-0301-00			TRANSISTOR:SILICON,PNP	04713	2N2907A
Q800	151-0301-00			TRANSISTOR:SILICON,PNP	04713	2N2907A
Q806	151-0301-00			TRANSISTOR:SILICON,PNP	04713	2N2907A
Q810	151-0301-00			TRANSISTOR:SILICON,PNP	04713	2N2907A
Q815	151-0301-00			TRANSISTOR:SILICON,PNP	04713	2N2907A
Q820	151-0301-00			TRANSISTOR:SILICON,PNP	04713	2N2907A
Q825	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q850	151-0220-00			TRANSISTOR:SILICON,PNP	80009	151-0220-00
Q854	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q865A,B	151-1042-00			SEMICOND DVC SE:MATCHED PAIR FET	80009	151-1042-00
Q885	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q930	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q935	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q936	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q937	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01

[1]Standard only
[2]Option 1 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q938	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q939	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q940	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q941	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q942	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q943	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q944	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q945	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q946	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q946	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q947	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q948	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q949	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q950	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q951	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q952	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q953	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q954	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q955	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q956	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q957	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q958	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q959	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q960	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q961	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q962	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q963	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q964	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q965	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q966	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q967	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q968	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q969	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q970	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q975	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q976	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q978	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q979	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q981	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q982	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q984	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q985	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
Q987	151-0190-01			TRANSISTOR:SILICON,NPN	80009	151-0190-01
Q989	151-0342-00			TRANSISTOR:SILICON,PNP	80009	151-0342-00
R10	305-0560-00			RES.,FXD,CMPSN:56 OHM,5%,2W	01121	HB5605
R12	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R14	307-0107-00			RES.,FXD,CMPSN:5.6 OHM,5%,0.25W	01121	CB56G5
R16	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R17	311-1563-00			RES.,VAR,NONWIR:1K OHM,20%,0.50W	73138	91A R1K
R18	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
R30	321-0260-00			RES.,FXD,FILM:4.99K OHM,1%,0.125W	91637	MFF1816G49900F
R31	321-0233-00			RES.,FXD,FILM:2.61K OHM,1%,0.125W	91637	MFF1816G26100F

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R34[1]	315-0132-00	XB010950		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
R34[2]	315-0132-00	XB010970		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
R34[3]	315-0132-00	XB010774		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
R35	315-0162-00			RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
R40	308-0701-00			RES.,FXD,WW:0.12 OHM,5%,2W	75042	BWH-R1200J
R42	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R55	301-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.50W	01121	EB5105
R58	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R60	307-0093-00			RES.,FXD,CMPSN:1.2 OHM,5%,0.50W	01121	EB12G5
R62	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R68	322-0212-00			RES.,FXD,FILM:1.58K OHM,1%,0.25W	75042	CEBT0-1581F
R72	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
R75	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
R78[1]	315-0512-00	B010100	B010299	RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R78[1]	315-0390-00	B010300		RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
R78[2]	315-0512-00	B010100	B010329	RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R78[2]	315-0390-00	B010330		RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
R78[3]	315-0512-00	B010100	B010297	RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R78[3]	315-0390-00	B010298		RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
R80[1]	315-0203-00	B010100	B010299	RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R80[1]	315-0202-00	B010300		RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R80[2]	315-0203-00	B010100	B010329	RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R80[2]	315-0202-00	B010330		RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R80[3]	315-0203-00	B010100	B010329	RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R80[3]	315-0202-00	B010330		RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R81[1]	315-0201-00	XB010950		RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R81[2]	315-0201-00	XB010970		RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R81[3]	315-0201-00	XB010774		RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R82	315-0303-00			RES.,FXD,CMPSN:30K OHM,5%,0.25W	01121	CB3035
R84	321-0373-00			RES.,FXD,FILM:75K OHM, 1%,0.125W	91637	MFF1816G75001F
R85	322-0194-00			RES.,FXD,FILM:1.02K OHM,1%,0.25W	75042	CEBT0-1021F
R86	311-1556-00			RES.,VAR,NONWIR:50K OHM,20%,0.50W	73138	91A R50K
R87	311-1557-00			RES.,VAR,NONWIR:25K OHM,20%,0.50W	73138	91A R25K
R88	321-0393-00			RES.,FXD,FILM:121K OHM,1%,0.125W	91637	MFF1816G12102F
R89	321-0346-00			RES.,FXD,FILM:39.2K OHM,1%,0.125W	91637	MFF1816G39201F
R92	315-0303-00			RES.,FXD,CMPSN:30K OHM,5%,0.25W	01121	CB3035
R94	321-0373-00			RES.,FXD,FILM:75K OHM, 1%,0.125W	91637	MFF1816G75001F
R96	311-1556-00			RES.,VAR,NONWIR:50K OHM,20%,0.50W	73138	91A R50K
R97	311-1557-00			RES.,VAR,NONWIR:25K OHM,20%,0.50W	73138	91A R25K
R98	321-0393-00			RES.,FXD,FILM:121K OHM,1%,0.125W	91637	MFF1816G12102F
R99	321-0346-00			RES.,FXD,FILM:39.2K OHM,1%,0.125W	91637	MFF1816G39201F
R100	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R102	315-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.25W	01121	CB2405
R104	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R110	322-0622-01			RES.,FXD,FILM:950K OHM,0.5%,0.25W	75042	CEBT0-9503D
R112	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R115	321-0360-00			RES.,FXD,FILM:54.9K OHM,1%,0.125W	91637	MFF1816G54901F
R120	321-0481-00			RES.,FXD,FILM:1M OHM,1%,0.125W	91637	MFF1816G10003F
R122	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R130	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R132	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R134[1]	315-0391-00	XB010950		RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R134[2]	315-0391-00	XB010970		RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R134[3]	315-0391-00	XB010774		RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915

[1]Standard only
[2]Option 1 only
[3]Option 4 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R136	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R138	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R142	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R145	311-1567-00			RES.,VAR,NONWIR:100 OHM,20%,0.50W	73138	91A-100ROM
R148	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R150[1]	311-1841-00			RES.,VAR,NONWIR:1K OHM,10%,1W	01121	14M003
R152	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R154	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R155	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R157	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R158	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R160	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R162	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R165	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R168	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R170	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R174[2]	315-0511-00	B010100	B010299	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R174[2]	315-0471-00	B010300		RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R174[3]	315-0511-00	B010100	B010329	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R174[3]	315-0471-00	B010330		RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R174[4]	315-0511-00	B010100	B010297	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R174[4]	315-0471-00	B010298		RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R178	315-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
R180	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R185	315-0151-00			RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
R188[2]	315-0152-00	B010100	B010299	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R188[2]	315-0132-00	B010300		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
R188[3]	315-0152-00	B010100	B010329	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R188[3]	315-0132-00	B010330		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
R188[4]	315-0152-00	B010100	B010297	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R188[4]	315-0132-00	B010298		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
R190[2]	315-0271-00	B010100	B011059X	RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R190[3]	315-0271-00	B010100	B011079X	RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R190[4]	315-0271-00	B010100	B011144X	RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R191[2]	315-0820-00	XB011060		RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
R191[3]	315-0820-00	XB011080		RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
R191[4]	315-0820-00	XB011145		RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
R193[2]	315-0131-00	XB011060		RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
R193[3]	315-0131-00	XB011080		RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
R193[4]	315-0131-00	XB011145		RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
R195	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R196	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R200	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R202	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R204	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
R205	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R210	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R212	315-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.25W	01121	CB2405
R214	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R220	322-0622-01			RES.,FXD,FILM:950K OHM,0.5%,0.25W	75042	CEBT0-9503D
R222	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R225	321-0360-00			RES.,FXD,FILM:54.9K OHM,1%,0.125W	91637	MFF1816G54901F
R230	321-0481-00			RES.,FXD,FILM:1M OHM,1%,0.125W	91637	MFF1816G10003F

[1]Furnished as a unit with S100
[2]Standard only
[3]Option 1 only
[4]Option 4 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R232	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R240	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R242	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R244[1]	315-0391-00	XB010950		RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R244[2]	315-0391-00	XB010970		RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R244[3]	315-0391-00	XB010774		RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R246	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R248	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R252	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R255	311-1567-00			RES.,VAR,NONWIR:100 OHM,20%,0.50W	73138	91A-100ROM
R258	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R260[4]	311-1841-00			RES.,VAR,NONWIR:1K OHM,10%,1W	01121	14M003
R262	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R264	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R265	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R267	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R268	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R270	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R272	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R275	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R278	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R280	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R284[1]	315-0511-00	B010100	B010299	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R284[1]	315-0471-00	B010300		RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R284[2]	315-0511-00	B010100	B010329	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R284[2]	315-0471-00	B010330		RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R284[3]	315-0511-00	B010100	B010329	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R284[3]	315-0471-00	B010330		RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R288	315-0390-00			RES.,FXD,CMPSN:39 OHM,5%,0.25W	01121	CB3905
R290	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R295	315-0151-00			RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
R298[1]	315-0152-00	B010100	B010299	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R298[1]	315-0132-00	B010300		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
R298[2]	315-0152-00	B010100	B01329	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R298[2]	315-0132-00	B010330		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
R298[3]	315-0152-00	B010100	B010297	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R298[3]	315-0132-00	B010298		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
R300	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R305	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R307	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R308	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
R315	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R317	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R320	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R324	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
R326	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R329	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R330	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R332	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R335	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R340	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R342	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R345	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915

[1]Standard only
[2]Option 1 only
[3]Option 4 only
[4]Furnished as a unit with S210

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R347	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R349	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R352	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R354	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R356	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R358	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R360	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R362	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R364	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R366	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R368	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R372	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R380	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R382	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R383	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R384	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R388	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R390	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R392	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R394	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R395	315-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.25W	01121	CB2405
R400	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R402	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R403[1]	315-0512-00	XB011060		RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R403[2]	315-0512-00	XB011080		RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R403[3]	315-0512-00	XB011145		RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R406	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R408	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R410	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R412	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R415	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R416	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R418	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R420	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R422	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R425	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R426	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R430	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R435	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R436	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R440	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R441	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R445	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R446	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R450	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R451	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R455	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R456	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R458[1]	315-0242-00	B010100	B011059	RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R458[1]	315-0102-00	B011060		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R458[2]	315-0242-00	B010100	B011079	RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R458[2]	315-0102-00	B011080		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R458[3]	315-0242-00	B010100	B011144	RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R458[3]	315-0102-00	B011145		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025

[1]Standard only
[2]Option 1 only
[3]Option 4 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R460	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R465	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R468[1]	315-0821-00	B010100	B011059	RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R468[1]	315-0511-00	B011060		RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R468[2]	315-0821-00	B010100	B011079	RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R468[2]	315-0511-00	B011080		RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R468[3]	315-0821-00	B010100	B011144	RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R468[3]	315-0511-00	B011145		RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R470	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R475[4]	311-1431-00			RES.,VAR,NONWIR:500K OHM,10%,0.25W	01121	GH8032
R478	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R479	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
R482	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R484	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
R487	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
R490	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R492[1]	315-0511-00	B010100	B011059	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R492[1]	315-0122-00	B011060		RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R492[2]	315-0511-00	B010100	B011079	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R492[2]	315-0122-00	B011080		RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R492[3]	315-0511-00	B010100	B011144	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R492[3]	315-0122-00	B011145		RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R494[1]	315-0202-00	B010100	B011059	RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R494[1]	315-0102-00	B011060		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R494[2]	315-0202-00	B010100	B011079	RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R494[2]	315-0102-00	B011080		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R494[3]	315-0202-00	B010100	B011144	RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R494[3]	315-0102-00	B011145		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R495[1]	315-0512-00	B010100	B011059X	RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R495[2]	315-0512-00	B010100	B011079X	RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R495[3]	315-0512-00	B010100	B011144X	RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R497	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R500	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R504	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R506	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R508	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R510	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R512	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R515	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R516	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R518	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R520	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R524	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R526	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R530	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	01121	CB9115
R532	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R535	315-0300-00			RES.,FXD,CMPSN:30 OHM,5%,0.25W	01121	CB3005
R537	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R540	315-0184-00			RES.,FXD,CMPSN:180K OHM,5%,0.25W	01121	CB1845
R542	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R543	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R545	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125

[1]Standard only
[2]Option 1 only
[3]Option 4 only
[4]Furnished as a unit with S475

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R547	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R550	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R554	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R560	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R565	315-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
R570	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R574	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R580	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R582[1]	315-0511-00	B010100	B011059	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R582[1]	315-0102-00	B011060		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R582[2]	315-0511-00	B010100	B011079	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R582[2]	315-0102-00	B011080		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R582[3]	315-0511-00	B010100	B011144	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R582[3]	315-0102-00	B011145		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R590	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R592	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R595	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R596	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R598	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R605	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R606	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R615[1]	315-0183-00	B010100	B010629	RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R615[1]	315-0273-00	B010630		RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R615[2]	315-0183-00	B010100	B010659	RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R615[2]	315-0273-00	B010660		RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R615[3]	315-0183-00	B010100	B010642	RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R615[3]	315-0273-00	B010643		RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R622	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R623	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R625	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R628	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R629	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R632	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R635	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R637	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R640	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R642	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R644	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
R647	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R655	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R656	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
R660	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R662	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
R664	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R666	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R668	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R670	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R672	315-0302-00			RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
R680	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R684	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R687	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R690	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R692	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125

[1]Standard only
[2]Option 1 only
[3]Option 4 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R695	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R697	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R699	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R701[1]	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R704	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R710	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R712	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R714	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R718	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R720	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R722	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R724	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R726	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R730	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R732	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R735	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R740	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R742	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R744	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R746	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R755	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R757	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
R765	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R768	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R770	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R774	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R775	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R776	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R777	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R780	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R781	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R782	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R783	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R784	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R785	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R786	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R790	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R791	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R793	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R794	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R796	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R797	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R800	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R801	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R803	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R804	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R806	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R807[2]	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R810	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R811	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R813	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
R815	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R816	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015

[1]Option 1 only
[2]Standard only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R820	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R821	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R822[1]	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R825	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R830	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R835	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R837	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R839	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R842	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R844	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
R847	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R850	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R854	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915
R856	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R860	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
R862	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R863	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R865	315-0133-00			RES.,FXD,CMPSN:13K OHM,5%,0.25W	01121	CB1335
R867	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R870	315-0910-00			RES.,FXD,CMPSN:91 OHM,5%,0.25W	01121	CB9105
R872[2]	315-0511-00	B010100	B010629	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R872[2]	315-0102-00	B010630		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R872[1]	315-0511-00	B010100	B010659	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R872[1]	315-0102-00	B010660		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R872[3]	315-0511-00	B010100	B010642	RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R872[3]	315-0102-00	B010643		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R875	315-0622-00			RES.,FXD,CMPSN:6.2K OHM,5%,0.25W	01121	CB6225
R876	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
R880	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R881	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
R883	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R885	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R887	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R890	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R891	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R895	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R897[2]	315-0201-00	B010100	B010629	RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R897[2]	315-0510-00	B010630		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R897[1]	315-0201-00	B010100	B010659	RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R897[1]	315-0510-00	B010660		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R897[1]	315-0201-00	B010100	B010659	RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R897[3]	315-0510-00	B010660		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
R900[3]	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R902[2]	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
R906[2]	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
R910[2]	315-0242-00			RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R912	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R914	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R916	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R918	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R919	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R920	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R922	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025

[1]Option 1 only
[2]Standard only
[3]Option 4 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R923	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R924	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R925	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R926	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R927	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R930	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R935	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R975	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R976	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R977	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R978	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R979	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R980	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R981	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R982	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R983	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R984	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R985	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R986	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R987	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R988	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R989	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R990	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
S90	260-1470-00			SWITCH,SLIDE:0.5A,125VAC	10389	23-021-309
S100[1]	311-1841-00			RES.,VAR,NONWIR:1K OHM,10%,1W	01121	14M003
S105A,B	260-1466-00			SWITCH,PUSH:DPDT,2 STA,NON-SHORT	80009	260-1466-00
S185	260-1445-00			SWITCH,PUSH:PP,1 STA,NON-SHORT	80009	260-1445-00
S195	263-1016-00			DRUM ASSY,CAM S:	80009	263-1016-00
S210[2]	311-1841-00			RES.,VAR,NONWIR:1K OHM,10%,1W	01121	14M003
S215A,B	260-1466-00			SWITCH,PUSH:DPDT,2 STA,NON-SHORT	80009	260-1466-00
S295	260-1445-00			SWITCH,PUSH:PP,1 STA,NON-SHORT	80009	260-1445-00
S475[3]	311-1431-00			RES.,VAR,NONWIR:500K OHM,10%,0.25W	01121	GH8032
S545, S575	260-1465-00			SWITCH,PUSH:2 STA,NON-SHORT	80009	260-1465-00
S895	105-0587-00			ACTR ASSY,SL SW:	80009	105-0587-00
S900	260-0723-00			SWITCH,SLIDE:DPDT,0.5A,125VAC	79727	GF126-0028
S950	105-0587-00			ACTR ASSY,SL SW:	80009	105-0587-00
U10	156-0071-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR	07263	723DC
U30	156-0071-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR	07263	723DC
U90	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	80009	156-0158-00
U190	156-0353-00			MICROCIRCUIT,DI:TPL 2-INPUT EXCL OR GATE	04713	MC1672L
U195	156-0205-00			MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE	80009	156-0205-00
U200	156-0226-00			MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE	80009	156-0226-00
U315	156-0230-00			MICROCIRCUIT,DI:DUAL D MA-SLAVE FLIP-FLOP	80009	156-0230-00
U340	156-0226-00			MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE	80009	156-0226-00
U342	156-0228-00			MICROCIRCUIT,DI:MASTER SLAVE TYPE D F-F	80009	156-0228-00
U345	156-0282-00			MICROCIRCUIT,DI:DUAL 4-INPUT OR NOR GATE	80009	156-0282-00
U350	156-0228-00			MICROCIRCUIT,DI:MASTER SLAVE TYPE D F-F	80009	156-0228-00
U355	156-0230-00			MICROCIRCUIT,DI:DUAL D MA-SLAVE FLIP-FLOP	80009	156-0230-00
U360	156-0230-00			MICROCIRCUIT,DI:DUAL D MA-SLAVE FLIP-FLOP	80009	156-0230-00
U390	156-0228-00			MICROCIRCUIT,DI:MASTER SLAVE TYPE D F-F	80009	156-0228-00
U400	156-0228-00			MICROCIRCUIT,DI:MASTER SLAVE TYPE D F-F	80009	156-0228-00

[1]Furnished as a unit with R150.
[2]Furnished as a unit with R260.
[3]Furnished as a unit with R475.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U410	156-0230-00			MICROCIRCUIT,DI:DUAL D MA-SLAVE FLIP-FLOP	80009	156-0230-00
U435	156-0042-00			MICROCIRCUIT,DI:J-K M/S FLIP-FLOP	01295	SN7476N
U440	156-0395-00			MICROCIRCUIT,DI:DECADE COUNTER	01295	SN7490AN
U445	156-0395-00			MICROCIRCUIT,DI:DECADE COUNTER	01295	SN7490AN
U450	156-0395-00			MICROCIRCUIT,DI:DECADE COUNTER	01295	SN7490AN
U455	156-0395-00			MICROCIRCUIT,DI:DECADE COUNTER	01295	SN7490AN
U495	156-0205-00			MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE	80009	156-0205-00
U497	156-0205-00			MICROCIRCUIT,DI:QUAD 2-INPUT NOR GATE	80009	156-0205-00
U500	156-0182-00			MICROCIRCUIT,DI:TRIPLE 2-3-2 INPUT GATE	04713	MC10105L
U580	156-0174-00			MICROCIRCUIT,DI:DUAL J-K MS,FLIP-FLOP	01295	SN74111N
U585	156-0150-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR	01295	SN7437N
U587	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	01295	SN7400N
U590	156-0118-00			MICROCIRCUIT,DI:J-K MASTER-SLAVE FLIP-FLOP	01295	SN74S112N
U610	156-0041-00			MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U620	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	01295	SN7400N
U625	156-0460-00			MICROCIRCUIT,DI:QUAD 2-INPUT OPEN COLL OUT	01295	SN7409N
U630	156-0058-00			MICROCIRCUIT,DI:HEX.INVERTER	01295	SN7404N
U650	156-0058-00			MICROCIRCUIT,DI:HEX.INVERTER	01295	SN7404N
U652	156-0398-00			MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT	27014	DM8551N
U655	156-0323-00			MICROCIRCUIT,DI:HEX. INVERTER	01295	SN74S04N
U657	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	01295	SN7400N
U675	156-0395-00			MICROCIRCUIT,DI:DECADE COUNTER	01295	SN7490AN
U676	156-0398-00			MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT	27014	DM8551N
U678	156-0395-00			MICROCIRCUIT,DI:DECADE COUNTER	01295	SN7490AN
U679	156-0398-00			MICROCIRCUIT,DI:QUAD LATCH W/TRI STATE OUT	27014	DM8551N
U700	156-0409-00			MICROCIRCUIT,DI:4 DIGIT DEC DECODER	50088	MK5007P
U715	156-0057-00			MICROCIRCUIT,DI:QUAD 2-INPUT NAND GATE	07263	7401PC
U720	156-0041-00			MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U750	156-0041-00			MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U755	156-0111-00			MICROCIRCUIT,DI:SGL BCD-TO-DEC DEC/DRIVER	01295	SN74145N
U760	156-0171-00			MICROCIRCUIT,DI:QUAD 2-INPUT OR GATE	01295	SN7432N
U765	156-0041-00			MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U780	156-0128-00			MICROCIRCUIT,DI:SGL BCD TO 7-SEG DCDR/DRVR	01295	SN7447AN
U835	156-0230-00			MICROCIRCUIT,DI:DUAL D MA-SLAVE FLIP-FLOP	80009	156-0230-00
U845	156-0230-00			MICROCIRCUIT,DI:DUAL D MA-SLAVE FLIP-FLOP	80009	156-0230-00
U855	156-0395-00			MICROCIRCUIT,DI:DECADE COUNTER	01295	SN7490AN
U856	156-0124-00			MICROCIRCUIT,DI:SGL FREQ/PHASE DETECTOR	80009	156-0124-00
U875	156-0266-00			MICROCIRCUIT,LI:EMITTER COUPLED OSCILLATOR	80009	156-0266-00
U880	156-0047-00			MICROCIRCUIT,DI:TPL 3-INPUT POS NAND GATE	80009	156-0047-00
U895	156-0410-00			MICROCIRCUIT,DI:COUNTER TIME BASE	50088	MK5009P
U900[1]	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	01295	SN7400N
U901[2]	156-0395-00			MICROCIRCUIT,DI:DECADE COUNTER	01295	SN7490AN
U920	156-0043-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NOR GATE	80009	156-0043-00
U922	156-0178-00			MICROCIRCUIT,DI:TRIPLE 3-INPUT NOR GATE	01295	SN7427N
U925	156-0150-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR	01295	SN7437N
VR34[1]	152-0217-00	XB010950		SEMICOND DEVICE:ZENER,0.4W,8.2V,5%	80009	152-0217-00
VR34[2]	152-0217-00	XB010970		SEMICOND DEVICE:ZENER,0.4W,8.2V,5%	80009	152-0217-00
VR34[3]	152-0217-00	XB010774		SEMICOND DEVICE:ZENER,0.4W,8.2V,5%	80009	152-0217-00
VR42	152-0227-00			SEMICOND DEVICE:ZENER,0.4W,6.2V,5%	80009	152-0227-00
VR55	152-0226-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	81483	69-6584
VR165	152-0217-00			SEMICOND DEVICE:ZENER,0.4W,8.2V,5%	80009	152-0217-00
VR170	152-0226-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	81483	69-6584
VR180	152-0226-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	81483	69-6584

[1]Standard only
[2]Option 1 only
[3]Option 4 only

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
VR275	152-0217-00			SEMICOND DEVICE:ZENER,0.4W,8.2V,5%	80009	152-0217-00
VR280	152-0226-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	81483	69-6584
VR290	152-0226-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	81483	69-6584
Y900[1]	158-0079-00			XTAL UNIT,QTZ:1 MHZ,+/-0.001%	80009	158-0079-00
Y901[2]	119-0503-00			OSCILLATOR,RF:15MHZ	71034	C214-1

[1]Standard only
[2]Option 1 only

OPTION INFORMATION

Your instrument may be equipped with one or more options. This section describes those options, or directs the reader to where the option is documented.

OPTION 1—Replaces internal 1 MHz oscillator (clock) circuitry with a self-contained, temperature compensated 5 MHz crystal oscillator system for increased accuracy and stability.

1. Schematic diagram will be found on diagram ◇5
2. Adjustment procedure will be found on Adjustments fold-out page.
3. Electrical components will be found in Electrical Parts List and on the Parts Location Grids for the Main Board.

OPTION 4—Provides decimal point data output through the rear-interface connectors. This option is intended for use with the 153 Calculator Instrumentation Interface system.

1. Schematic wiring information will be found on diagram ◇5
2. The decimal point logic levels go LOW to turn on the decimal point to the left of the digits associated with time slots TS-3 through TS-7.
3. The following data relates the DC 505A rear-interface connector pins with decimal point information for the 153 Calculator Instrumentation Interface system.

NOTE

Decimal point numbers refer to Calculator decimal points.

DP 1	Pin 15A
DP 2	Pin 14B
DP 3	Pin 15B
DP 4	Pin 18B
DP 5	Pin 27B

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols and Reference Designators

Electrical components shown on the diagrams are in the following units unless noted otherwise:

Capacitors = Values one or greater are in picofarads (pF).
Values less than one are in microfarads (μF).
Resistors = Ohms (Ω).

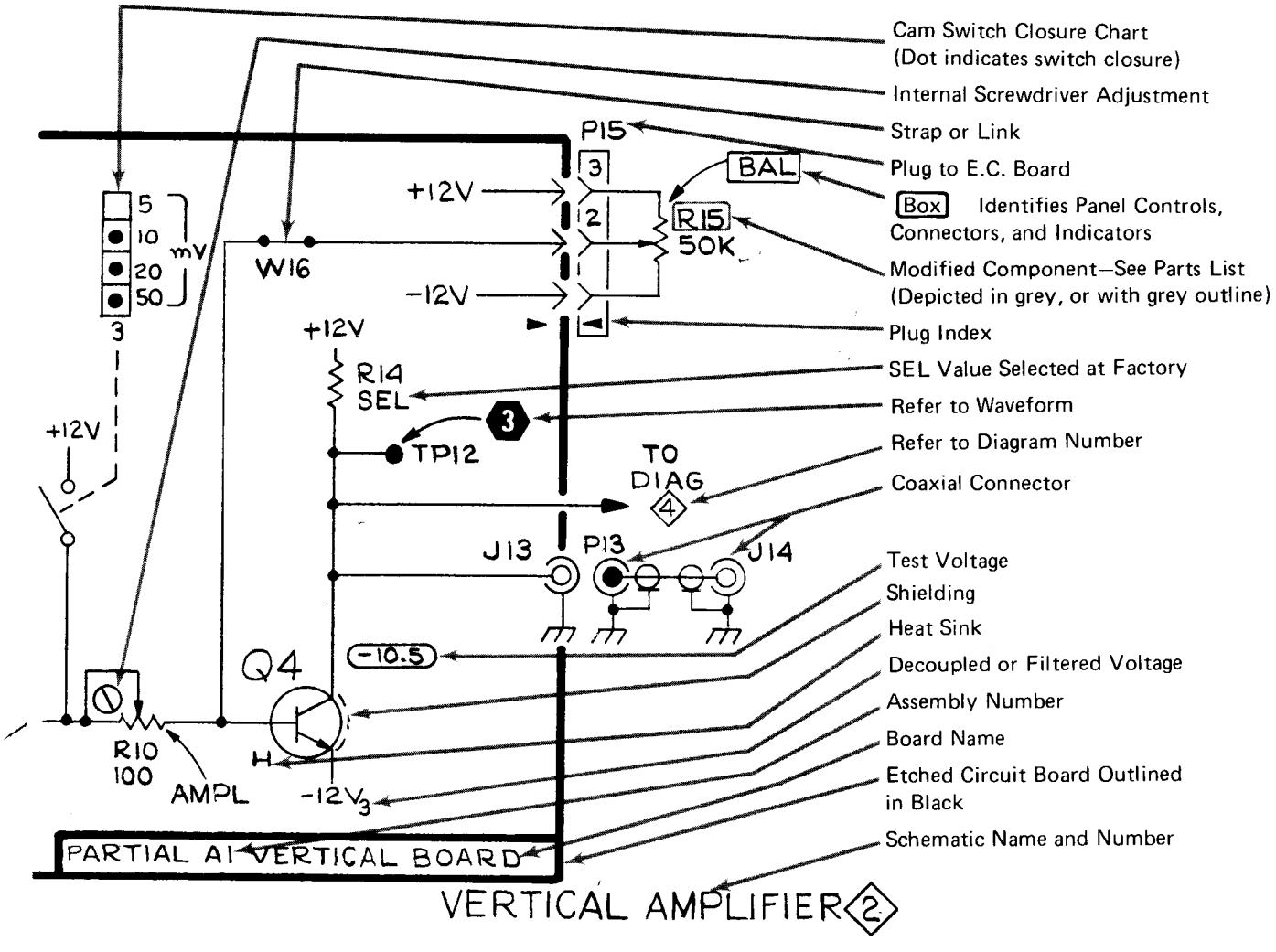
Symbols used on the diagrams are based on ANSI Standard Y32.2-1975.

Logic symbology is based on ANSI Y32.14-1973 in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

The following prefix letters are used as reference designators to identify components or assemblies on the diagrams.

A	Assembly, separable or repairable (circuit board, etc.)	H	Heat dissipating device (heat sink, heat radiator, etc.)	S	Switch or contactor
AT	Attenuator, fixed or variable	HR	Heater	T	Transformer
B	Motor	HY	Hybrid circuit	TC	Thermocouple
BT	Battery	J	Connector, stationary portion	TP	Test point
C	Capacitor, fixed or variable	K	Relay	U	Assembly, inseparable or non-repairable (integrated circuit, etc.)
CB	Circuit breaker	L	Inductor, fixed or variable	V	Electron tube
CR	Diode, signal or rectifier	M	Meter	VR	Voltage regulator (zener diode, etc.)
DL	Delay line	P	Connector, movable portion	W	Wirestrap or cable
DS	Indicating device (lamp)	Q	Transistor or silicon-controlled rectifier	Y	Crystal
E	Spark Gap	R	Resistor, fixed or variable	Z	Phase shifter
F	Fuse	RT	Thermistor		
FL	Filter				

The following special symbols are used on the diagrams:



INPUT-OUTPUT ASSIGNMENTS FOR PLUG-IN REAR INTERFACE CONNECTOR

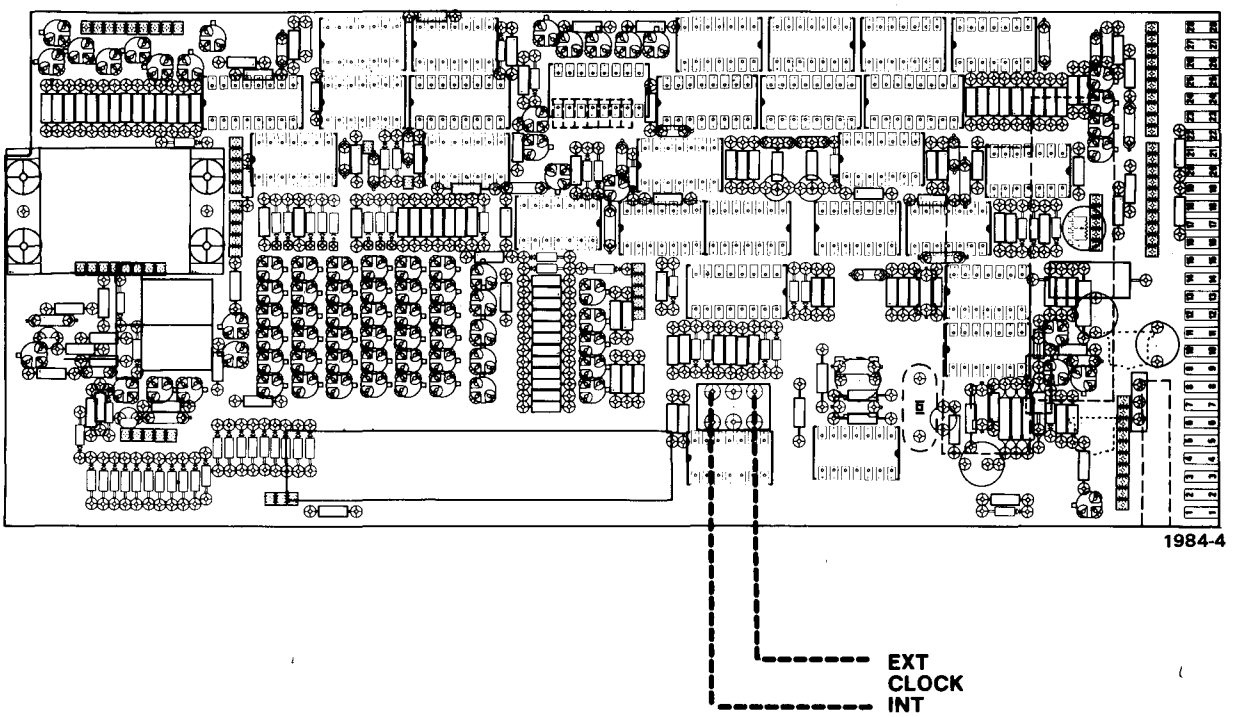
Remarks	Output or Input	Pin B		Pin A	Output or Input	Remarks
		28		28		
		27		27	Internal Scan Clock Disable	
	Manual Start-Stop	26		26	Reset	
	Internal Scan Clock Out	25		25	Time Slot Zero (TSO)	
		24		24		
	Overflow Signal	23	Measurement Barrier Slot	23		
		22		22	Trig Level Out	
	BCD Output, 2	21		21		
	Serial-by-Digit 8	20		20	4 BCD Output	
	Data Good	19		19	1 Serial-by-Digit	
		18		18		
	CH B Input	17		17	CH A GND	
	CH B GND	16		16	CH A Input	
		15		15		
		14		14	1 MHz Clock Out/ Ext Clock In	
	25 VAC winding	13		13	25 VAC winding	
	33.5 V filtered DC	12		12	33.5 V filtered DC	
	Collector Lead of PNP Series-Pass	11		11	Base Lead of PNP Series-Pass	
	Transformer shield lead	10		10	Emitter Lead of PNP Series-Pass	
	±33.5 V common return	9*		*9	33.5 V common return	
	−33.5 V filtered dc	8	TM 500 Barrier Slot	8	−33.5 V filtered dc	
	Collector Lead of NPN Series-Pass	7*		*7	Emitter Lead of NPN Series-Pass	
	No connection	6		*6	Base Lead of NPN Series-Pass	
	17.5 VAC winding	5		5	17.5 VAC winding	
	+11.5 V common return	4*		*4	+11.5 V common return	
	+11.5 V common return	3*		*3	+11.5 V common return	
	+11.5 V filtered DC	2*		*2	+11.5 V filtered DC	
	25 VAC winding	1*	Rear View of Plug In	*1	25 VAC winding	
		B		A		

Assignments listed for pins 1A-13A and 1B-13B are available in all power modules; however only those pins marked with an asterisk (*) are used by the DC 505A.

CONTROLS

INT-EXT Clock Selection Switch

When facing front of DC 505A the slide switch mounted on the Main (right) Circuit Board should be in the forward position (towards front of instrument) to select internal clock. Slide switch back (towards rear of instrument) when external clock input is desired.



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CONTROLS AND CONNECTORS

Display Readout

LED readout, seven 7-segment digits with automatically placed decimal point. The leading zeroes are suppressed unless an overflow is indicated.

Units Indicators

LED indicates that displayed number is MHz (10^6), or kHz (10^3) if in FREQ A modes, or ns (10^{-9}), μs (10^{-6}), or ms (10^{-3}), if in a time mode. In the RATIO A/B, EVENTS A DURING B and TOTALIZE A modes, no units are indicated.

Gate Indicator

Lights during the active gating interval.

A OUT

Connector that provides a shaped ≈0.2 V output signal derived from the output of the channel A shaper circuit. The signal is high during the duration of the triggering window for the A input signal.

LEVEL

Selects the amplitude point on the input signal at which the triggering window is placed. Also selects signal input source. Pulled out selects the rear connector input. Pushed in selects the front-panel BNC connector input.

SLOPE

A push-push switch which selects the slope of the input signal on which triggering will occur.

ATTEN

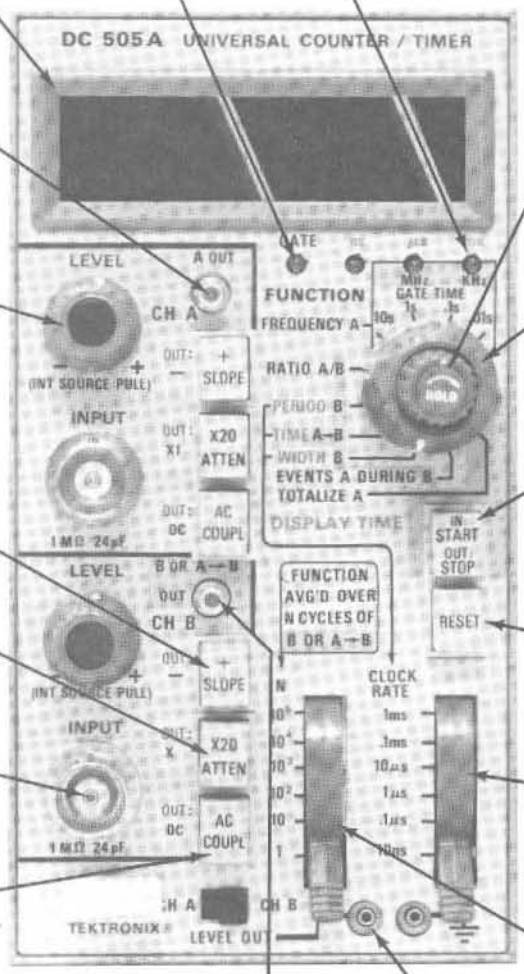
Self-canceling button selects X1, or X20 attenuation of the input signal.

INPUT

BNC connector for signal input.

Input Coupling

A push-push switch which selects whether the input signal is AC or DC coupled into the attenuators.



DISPLAY TIME

Variable control concentric with FUNCTION switch sets the length of time the reading will be displayed after the count is made and before the next measurement is taken. Display time can be varied from 0.1 s (ccw) to about 10 seconds (cw). HOLD position (detent) provides continuous display until reset by pressing the RESET button.

FUNCTION

Selects measurement or time counting modes for counter. Also selects the gate (measurement) interval in the four FREQ A positions.

Manual Gate

Push-push switch operable when TOTALIZE A is selected by the FUNCTION switch. Button in starts the measurement interval gate; button out terminates the gate.

RESET

Momentary pushbutton which manually resets (acts as a master reset) and provides a segment check of the 7 readout digits.

CLOCK RATE

Selects the rate in the PERIOD B, TIME A→B, and WIDTH B modes of the FUNCTION switch at which pulses will be counted, when the gate is opened by the input signal(s).

FUNCTION AVG'D

Selects the number of measurements to be averaged in the RATIO A/B PERIOD B, TIME A→B, WIDTH B and EVENTS A DURING B modes of FUNCTION switch.

B or A→B OUT Connector

Connector which provides a shaped ≈0.2 V output signal derived from the output of the channel B shaper and FUNCTION circuit for the RATIO A/B, PERIOD B, WIDTH B, and EVENTS A DURING B modes of the FUNCTION switch. The shaped ≈0.2 V output signal for the TIME→B of the FUNCTION switch is derived from the output of the time A→B circuit. The signal is high during the duration of the triggering window for the B input signal in the RATIO A/B, PERIOD B, WIDTH B, and EVENTS DURING B modes. In the TIME A→B mode, the signal is high from the selected slope of the A input signal to the selected slope of the B input signal.

LEVEL OUT

Output jack for monitoring triggering level of CH A or CH B.

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TEST EQUIPMENT REQUIRED

The following test equipment and accessories, or equivalent, is required for complete adjustment/calibration of the DC 505A. Specifications listed are the minimum necessary for adjustments or measurements. All test equipment is assumed to be correctly calibrated.

If other test equipment or accessories are substituted, control settings or adjustment setup may need to be altered to meet the requirements of the equipment used. Detailed operating instructions for the test equipment are not given in the adjustment/calibration procedures. Refer to the instruction manual for the test equipment if more information is desired.

1. TM 500-Series Power Module.

2. TM 500 Heavy-Duty Plug-in Extender. Tektronix Part Number 067-0645-02.

3. Digital Multimeter. Input resistance 10 MΩ. Tektronix DM 501.

4. 1 MHz Frequency Standard. The over-all accuracy of the standard used will determine the accuracy of the internal time base adjustment. For maximum obtainable accuracy adjustment, the frequency standard should be better than 2 parts in 10^8 (1 part in 10^9 for Option 1).

5. Leveled Sine-Wave Generator. Tektronix SG 503 (with accessory cable).

6. Pulse Generator. Output amplitude adjustable from −5 V to +5 V. Output pulse risetime one nanosecond or less. Tektronix PG 502 (with accessory cable).

7. Real time and Sampling Oscilloscope system. Tektronix 5403/D40/5A38/5B40 and Tektronix 5S14N Sampling Unit.

8. 10X Probe. Tektronix P6060.

9. 100X Probe. Tektronix P6057.

10. Function Generator. Tektronix FG 501 or FG 502.

11. Sealectro adapter to BNC connector cable (furnished with DC 505A). Tektronix Part Number 012-0532-00.

12. (2) 50-Ω BNC Coaxial Cables. Tektronix Part Number 012-0057-01.

13. 50-Ω 10X (20 dB) Attenuator. Tektronix Part Number 011-0059-02.

14. 50-Ω Feedthrough Termination. Tektronix Part Number 011-0049-01.

15. Dual Input Cable, BNC Connectors, Tektronix Part Number 067-0525-00.

16. Adapter, BNC T. Tektronix Part Number 103-0030-00.

Calibration Interval

Check the adjustments/calibration of the DC 505A every 1000 hours of operation, or every six months if used infrequently. Before calibration, thoroughly clean and inspect this instrument (refer to Power Module instruction manual).

Test Equipment

Test equipment and accessories required for adjustments and measurements for the DC 505A are listed under TEST EQUIPMENT REQUIRED.

Services Available

Tektronix, Inc. provides complete instrument repair and calibration at local Field Service Centers and at the Factory Service Center. Contact your local Tektronix Field Office or representative for further information.

Procedure

NOTE

The performance of this instrument can be checked at any temperature between 0° C and +40° C. Make any adjustment at a temperature between +20° C and +30° C (+68° F and +86° F).

Check that the correct nominal line selector block has been installed on the line selector pins on the Power Module (refer to Power Module manual). Remove the DC 505A side covers and connect the DC 505A to the Power Module using the Heavy-Duty Plug-in Extender. Allow at least 30 minutes warmup for the DC 505A and all equipment before any adjustment is made.

1. Adjust/Check Power Supplies

Connect the DM 501 Digital Voltmeter between the +15 V Test point (TP1) and ground. Adjust R17 for a reading of +15.00 V. Check the +5 V (TP2) and −10 V (TP3) supplies to be within 5%. Disconnect voltmeter.

2. Adjust Internal Time Base (1 MHz Clock)

a. Connect 1 MHz Frequency Standard (2 parts in 10^8) to Ext Trig input of the test oscilloscope. Apply (via 10X Probe) the 1 MHz Clock signal (14A) from DC 505A to Vert Input of the oscilloscope. Set oscilloscope time base for a calibrated 0.2 μs/div sweep rate. Adjust oscilloscope controls for a vertical amplitude (display may be drifting horizontally).

b. Adjust C905 through small hole in trigger circuit board for minimum horizontal drift of the displayed signal. When C905 is properly adjusted, the horizontal drift must be equal to or less than 5 div/10 sec. This sets the 1 MHz Clock to within 1 part in 10^7. Disconnect Frequency Standard and 10X Probe.

NOTE

For an Option 1 DC 505A, follow essentially the same procedure as called out in steps 2a and 2b, except: use a 1 MHz Frequency Standard (1 part in 10^9) and set oscilloscope time base to 10 ns/div. Remove the slotted plug from the oscillator and adjust an interior hex-type tuning slug for a minimum horizontal drift of 5 div/10 sec, or less. If replacing the slotted plug in the oscillator causes the drift to exceed 5 div/10 sec, readjust the tuning slug so that the drift is within 5 div/10 sec with slotted plug installed (a drift of 5 div/10 sec using a 10 ns/div sweep rate is equivalent to 5 parts in 10^9). Trace drifting to the right is a positive error; drift to the left is a negative error.

3. Check/Adjust Phase Lock Voltage

Connect DM 501 Digital Voltmeter positive lead to the junction of R870 and CR870; negative lead to ground. Check that the voltage reading is between 2.2 V and 2.9 V. If necessary, adjust the spacing of coil L870 to obtain a voltage reading of 2.6 V. Disconnect voltmeter.

4. Adjust/Check CH A LEVEL Center

a. Connect output of SG 503 to CH A INPUT of the DC 505A. Terminate SG 503 cable with 50-Ω feedthrough termination. Select a 150 mV (peak-to-peak), 3 MHz signal from the SG 503. Set DC 505A FUNCTION switch to FREQUENCY A, 0.1 s GATE TIME. Set CH A controls for X1 ATTEN, AC COUPL, +SLOPE, and center the dot of the LEVEL control with knob pushed in.

b. Adjust R255 until the readout displays 3 MHz. Select −SLOPE for CH A and check that readout still displays 3 MHz. If all zeros appear in the display, readjust R255 until display reads 3 MHz for both +SLOPE and −SLOPE selection.

5. Adjust/Check CH B LEVEL Center

a. Disconnect SG 503 output cable and 50-Ω termination from CH A INPUT and connect to CH B INPUT. Retain 150 mV, 3 MHz signal from SG 503. Set DC 505A FUNCTION switch to PERIOD B. Set CH B controls for X1 ATTEN, AC COUPL, +SLOPE. Set N switch to 10^5 and CLOCK RATE to 1 μs. Center dot on CH B LEVEL control with knob pushed in.

b. Adjust R145 so that GATE light flashes for both +SLOPE and −SLOPE selection. Disconnect all test equipment and accessories from DC 505A.

6. Adjust CH A and CH B Transient Response.

a. A Tektronix 5S14N Sampling Unit was used for this step. Set the 5S14N controls for zero delay, 10 ns/div sweep rate, 0.1 V/div vertical deflection factor, and use Internal Triggering with +Slope. Use Repetitive Scanning (REP) with SCAN control fully clockwise. Select LO NOISE and use CH 2 50-Ω Input (non-inverted).

b. Connect PG 502 output accessory cable via 10X Attenuator to 5S14N (CH 2). Set PG 502 Period and Duration controls to display a single positive pulse about five horizontal divisions wide. Adjust PG 502 HIGH and LOW LEVEL controls for +2 and −2 divisions of vertical deflection (+0.2 V and −0.2 V for a total of 0.4 V displayed). This establishes a 4 V output pulse from the PG 502. Set DC 505A for +SLOPE, AC COUPL, X1 ATTEN.

c. First adjust CH A and then CH B. Disconnect PG 502 cable and 10X Attenuator from 5S14N and connect to CH A INPUT via a 50-Ω Feedthrough Termination. Connect P6057 100X Probe to CH 2 of 5S14N and place probe tip on TP7 (TP8 for CH B). Attach probe ground clip to nearest BNC ground on the circuit board. Set 5S14N for 10 mV/div and INVERT CH 2. DC 505A LEVEL control may need adjusting to center the display.

d. Adjust C245 (C135 for CH B) for a positive pulse that displays an optimum square corner with minimum ringing (total system aberrations not to exceed 15% of the peak-to-peak amplitude).

e. Remove the 10X Attenuator from the system and depress the DC 505A X20 ATTEN button. Reconnect the PG 502 output to the DC 505A. Pulse waveform should now have one-half the previous amplitude with no ringing. Front-corner overshoot during the first 5 ns is a normal condition. Disconnect all test equipment and remove the 5S14N Sampling Unit. Reinstall the 5B40 Time Base.

7. Adju

This
as a Dua
ALTERN

a. Us
Coaxial
CH A ar
amplifie
(GND =
ground
channel
Position
(0 V).

b. Se
output a
oscillosc
oscillosc
positive-
through
divisions
display

c. Co
Sealectr
of DC 5
FUNCTI
CH A. A
controls
displaye
OUT and
Set DM

Typical
always p

d. Fi
procedu
knob so
graticule
centered
OUT cir
control a
A edge
Adjust R
501. For
CW and
DM 501

ADJUSTMENTS

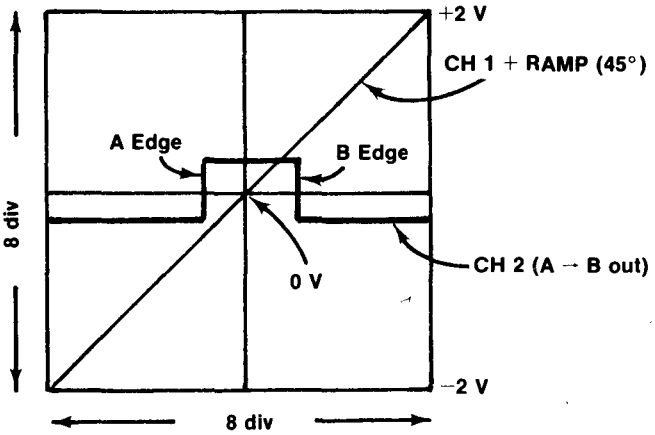
7. Adjust/Check CH A and CH B LEVEL OUT

This step requires that the 5403/D40/5A38/5B40 units be used as a Dual-Channel Oscilloscope (real time) operating in a vertical ALTERNATE mode.

a. Using the Dual-Input Cable, BNC T Adapter, and 50-Ω Coaxial Cables, connect the output of the Function Generator to CH A and CH B of the DC 505A and then to CH 1 of the vertical amplifier unit. Use CH 1 Position control to set ground reference (GND = 0 V) at center graticule with CH 1 at 0.5 V/div. After ground reference for CH 1 has been set, dc-couple both vertical channels and set CH 2 for 0.2 V/div. Do not readjust CH 1 Position control unless trace drifts from ground reference level (0 V).

b. Set Function Generator controls for about 150 Hz, +Ramp, output amplitude from −2.5 V to +2.5 V. Set vertical mode of oscilloscope to ALT. Set 5B40 sweep rate for 0.2 ms/div, then use oscilloscope and Function Generator controls to establish a positive-going 45° Ramp displayed on CH 1. Ramp must pass through the zero volt reference level of the center 8 X 8 graticule divisions. Do not use CH 1 Position control to adjust the +Ramp display because the ground reference level will be lost.

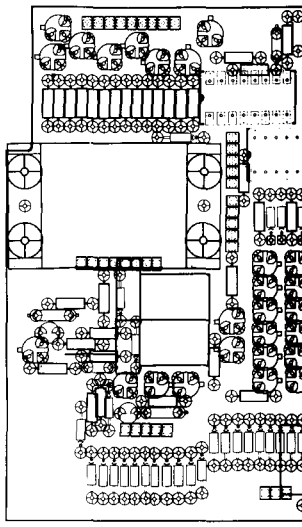
c. Connect B OR A→B OUT from DC 505A to CH 2 (via Sealectro Adapter to BNC connector cable). Set CH A and CH B of DC 505A for +SLOPE, X1 ATTEN, and DC COUPL. Set FUNCTION switch to TIME A→B. Set LEVEL OUT switch to CH A. Adjust DC 505A LEVEL knobs so that CH A LEVEL knob controls the horizontal movement of the start edge of the pulse displayed on CH 2 (see illustration). Connect DC 505A LEVEL OUT and ground to HI and LO inputs of the DM 501, respectively. Set DM 501 for DC VOLTS (2 V range).



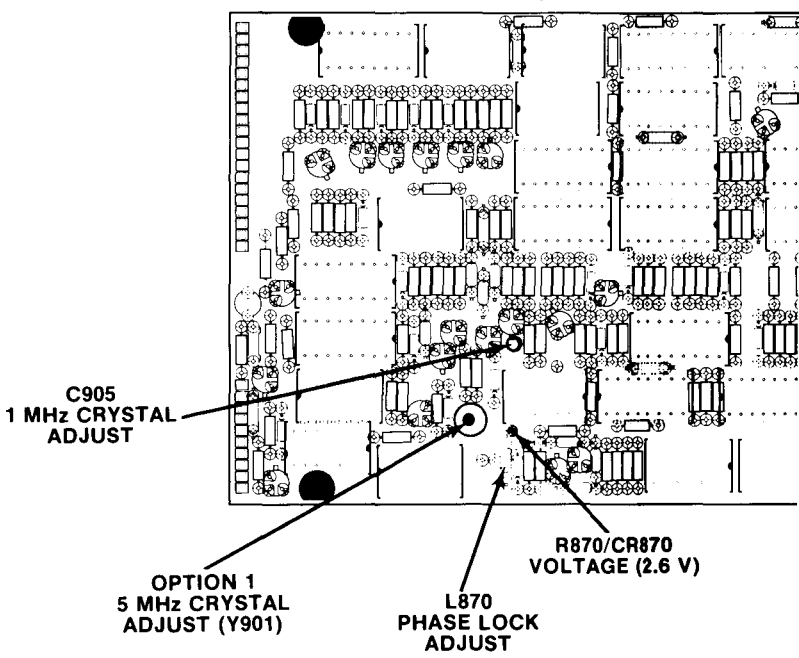
Typical display after completion of step 7c. A Edge is always positive-going, B Edge negative-going.

d. First adjust/check CH A LEVEL OUT, then repeat this procedure for CH B LEVEL OUT. Adjust CH A (CH B) LEVEL knob so that A edge (B edge) crosses the +Ramp at 0 V (center graticule). Verify that CH A (CH B) LEVEL knob is mechanically centered. Adjust R87, CH A BIAS, (R97 for CH B BIAS), on LEVEL OUT circuit board for 0.00 V on the DM 501. Use CH 2 Position control and rotate CH A LEVEL (CH B LEVEL) control knob until A edge (B edge) crosses the +Ramp at +1.5 V (up 3 divisions). Adjust R86, CH A GAIN, (R96 for CH B GAIN), for 1.5 V on the DM 501. For each DC 505A channel, rotate the respective LEVEL knob CW and CCW and verify that the output voltage monitored on the DM 501 will exceed plus and minus 2.0 Volts.

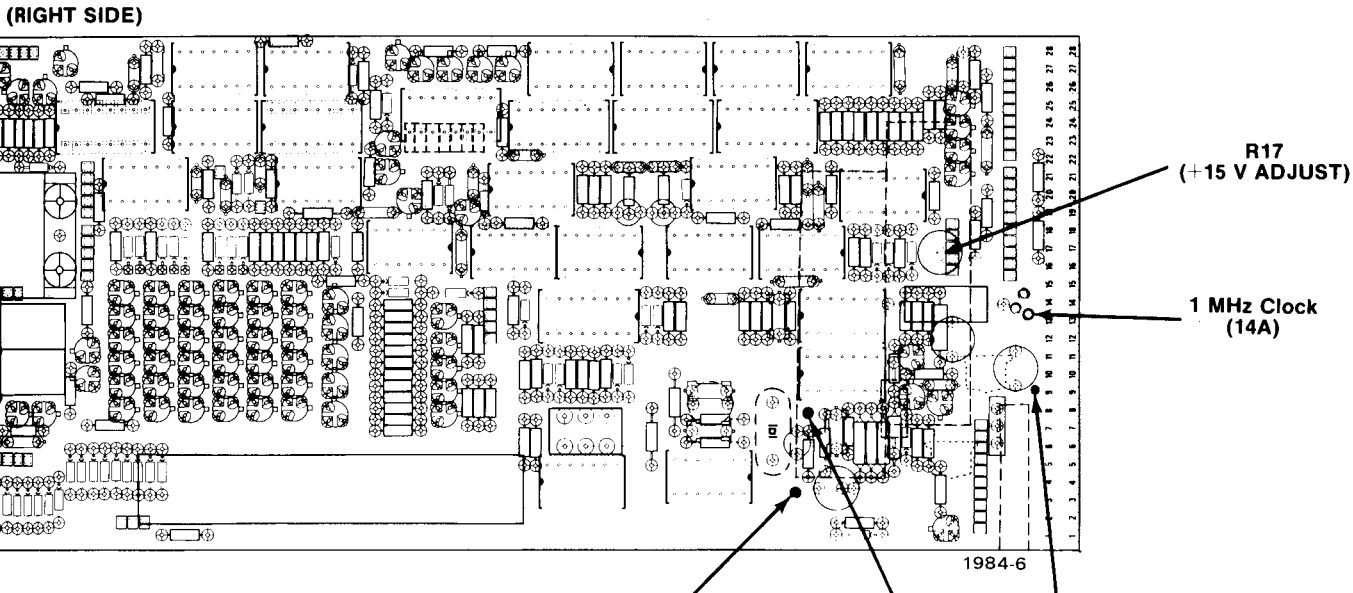
MAIN BOARD (RIGHT SIDE)

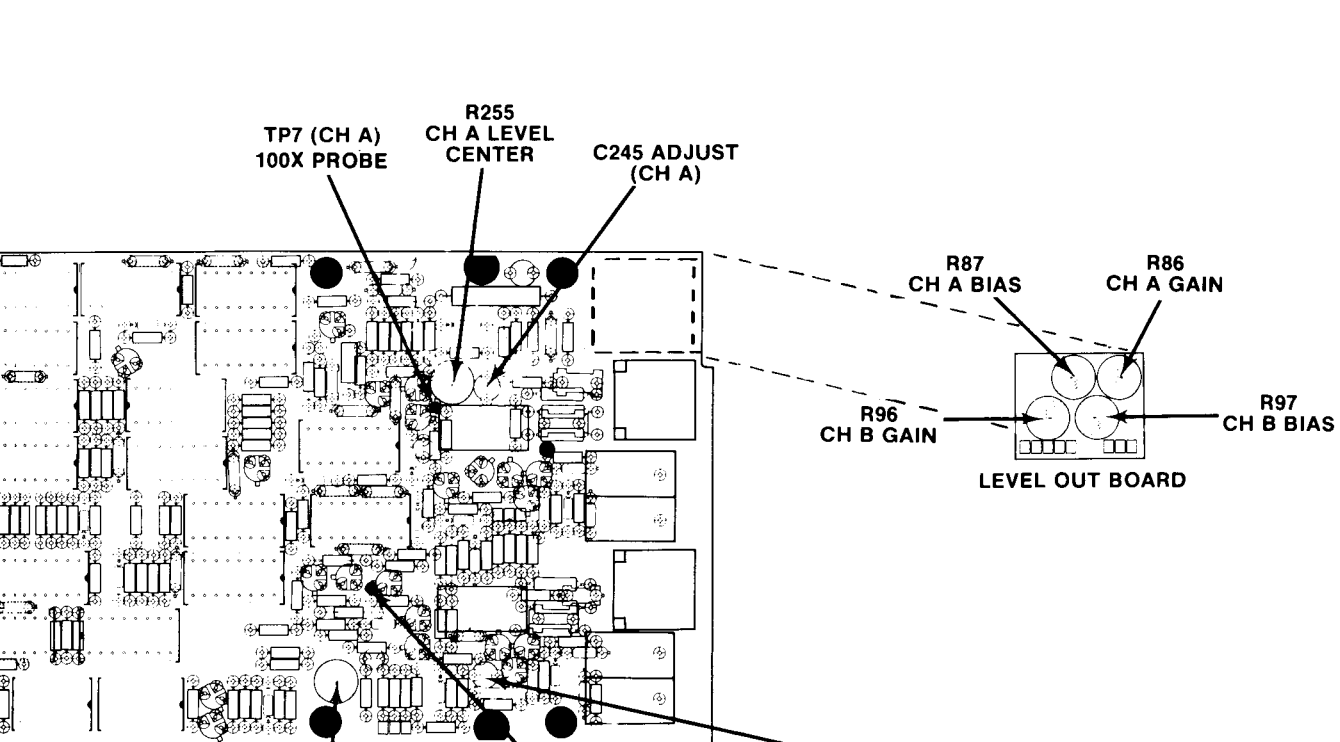


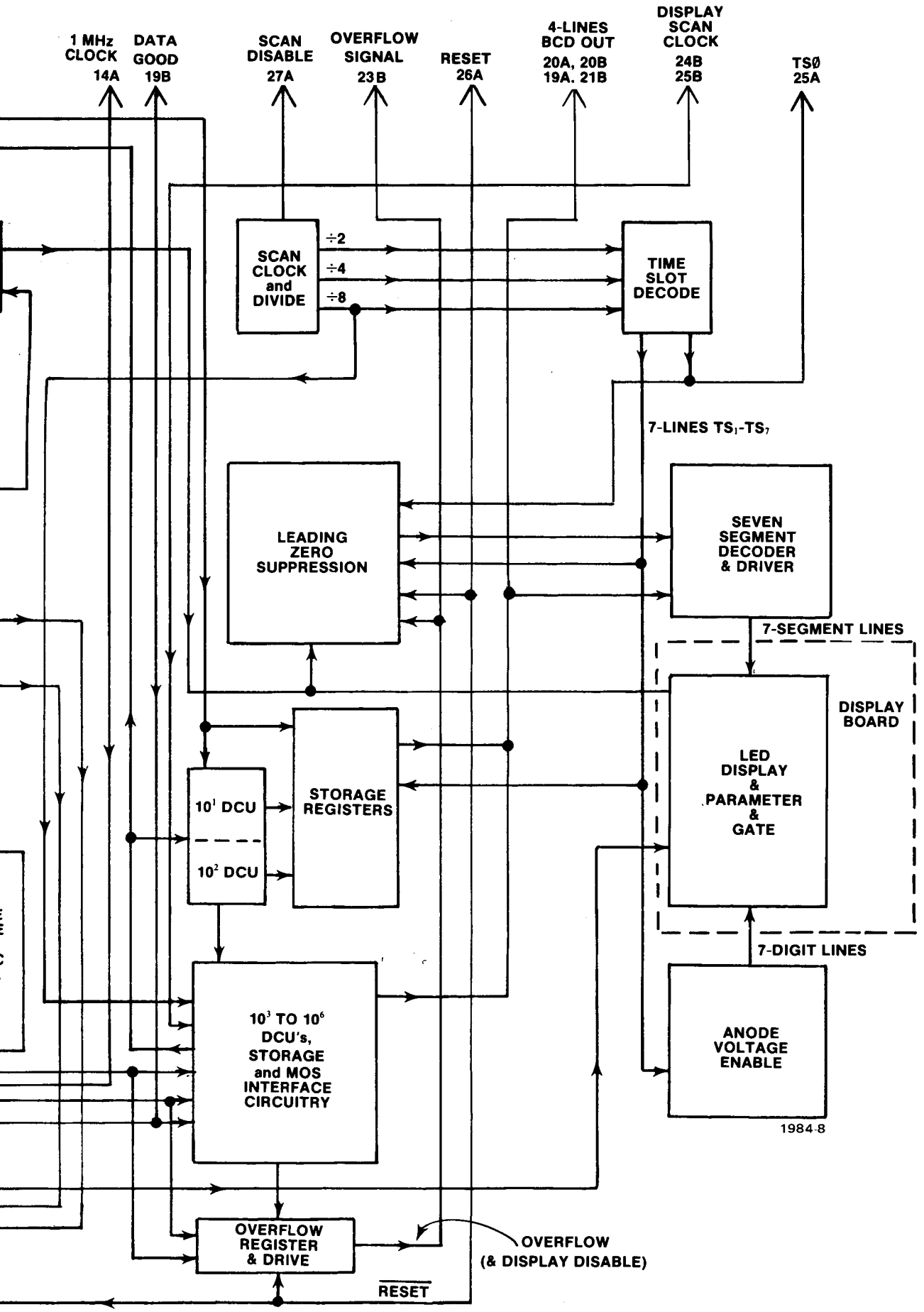
TRIGGER BOARD (LEFT SIDE)

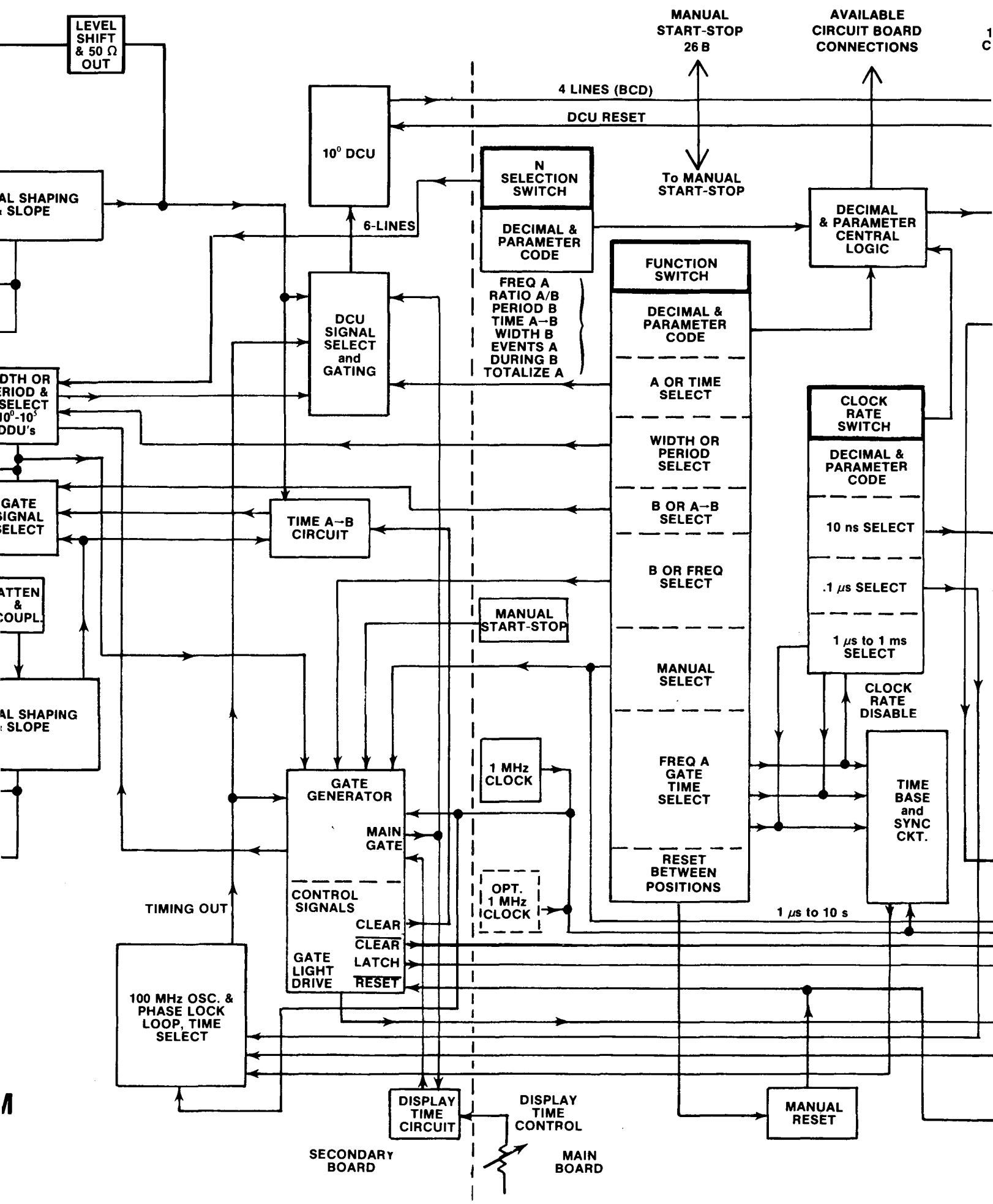


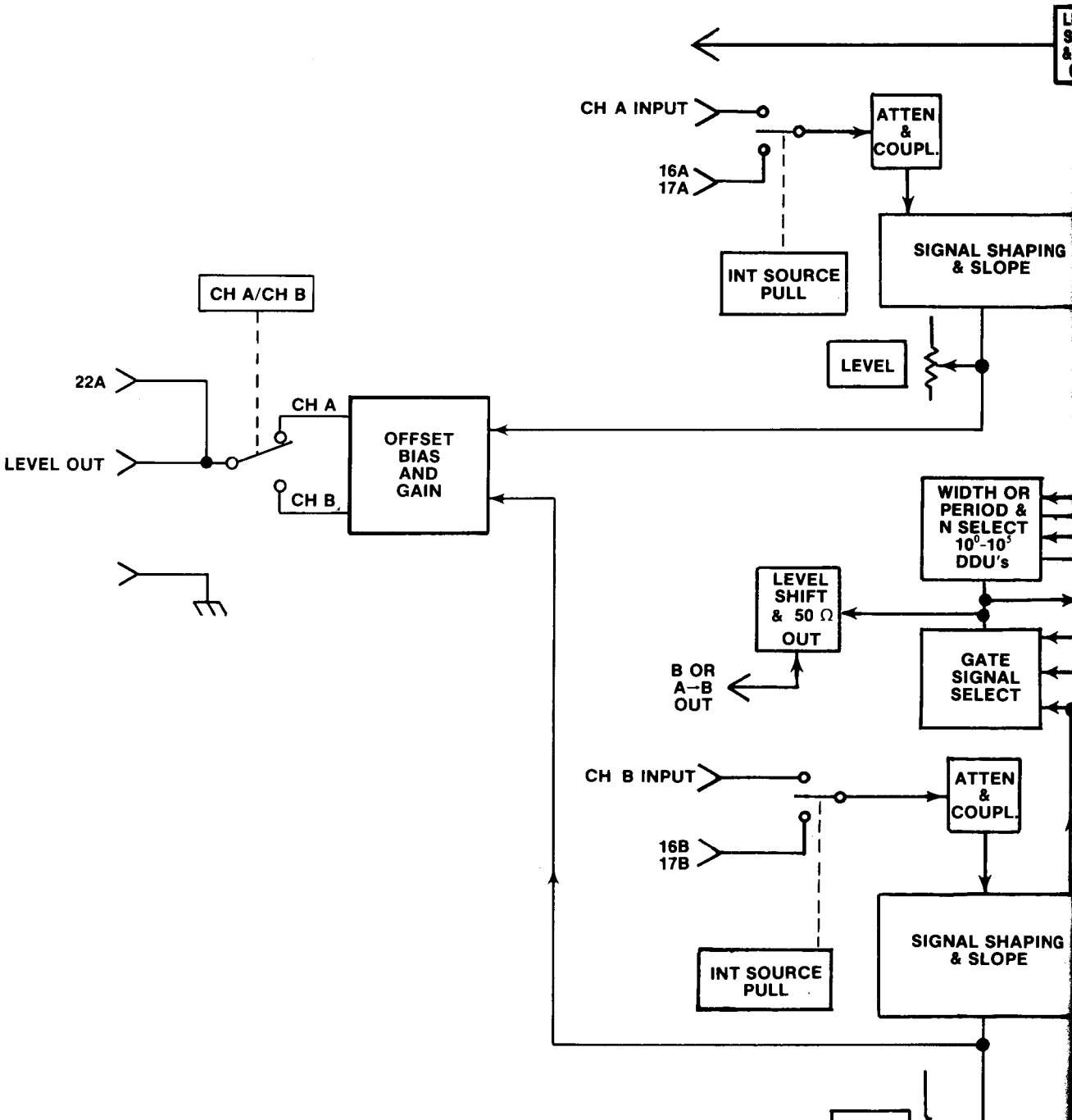
(RIGHT SIDE)


R17
(+15 V ADJUST)
1 MHz Clock
(14A)
1984-6
TP1
(+15 V)
TP2
(+5 V)
TP3
(−10 V)


TP7 (CH A)
100X PROBE
R255
CH A LEVEL
CENTER
C245 ADJUST
(CH A)
R87
CH A BIAS
R86
CH A GAIN
R96
CH B GAIN
R97
CH B BIAS
LEVEL OUT BOARD
1984-7
C135 ADJUST
(CH B)
R145
CH B LEVEL
CENTER
TP8 (CH B)
100X PROBE
1870
(2.6 V)

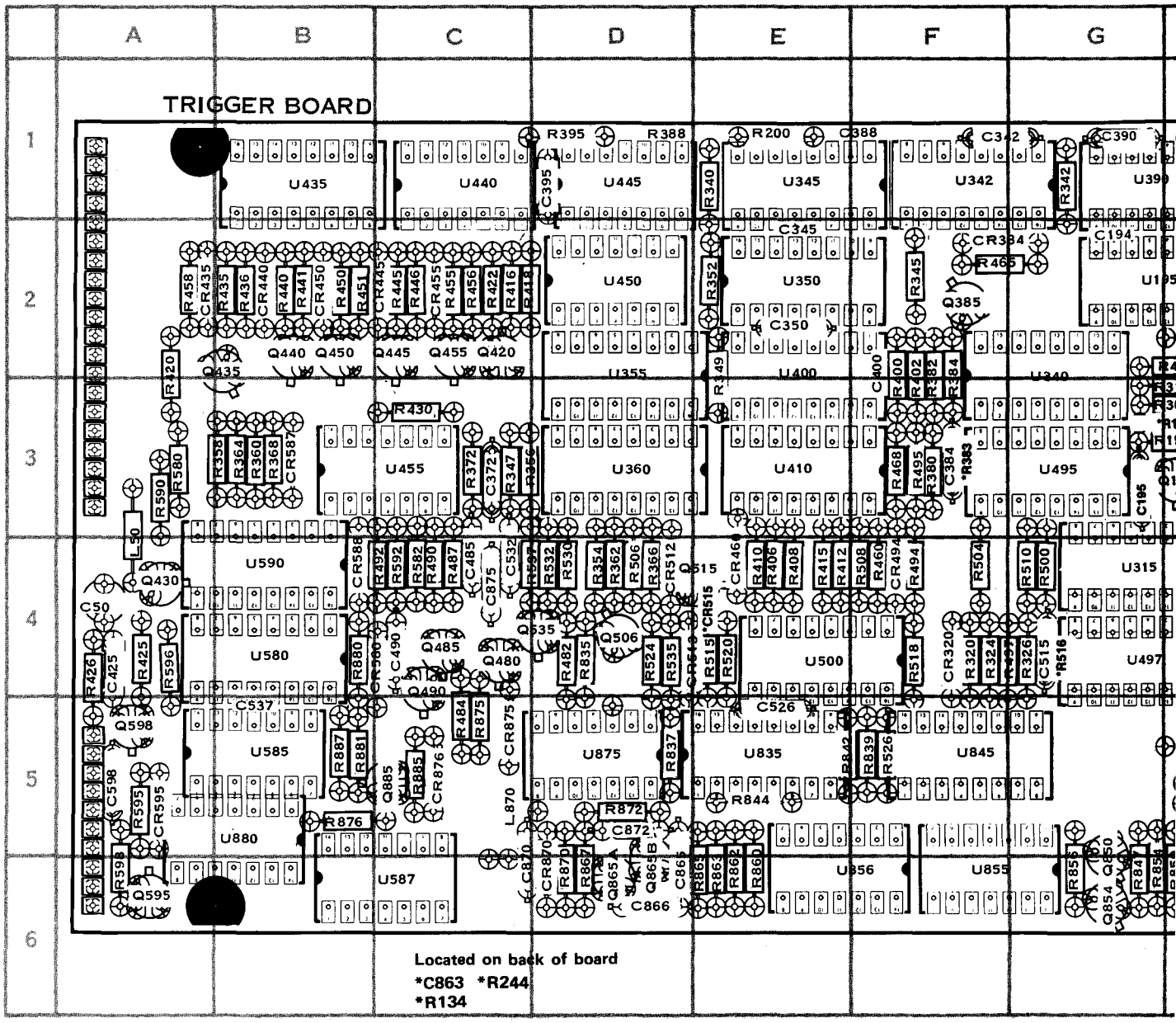

1 MHz CLOCK 14A
DATA GOOD 19B
SCAN DISABLE 27A
OVERFLOW SIGNAL 23B
RESET 26A
4-LINES BCD OUT 20A, 20B 19A. 21B
DISPLAY SCAN CLOCK 24B 25B
TSØ 25A
SCAN CLOCK and DIVIDE
÷2
÷4
÷8
TIME SLOT DECODE
7-LINES TS1-TS7
LEADING ZERO SUPPRESSION
SEVEN SEGMENT DECODER & DRIVER
7-SEGMENT LINES
DISPLAY BOARD
LED DISPLAY & PARAMETER & GATE
STORAGE REGISTERS
10¹ DCU
10² DCU
7-DIGIT LINES
10³ TO 10⁶ DCU's, STORAGE and MOS INTERFACE CIRCUITRY
ANODE VOLTAGE ENABLE
OVERFLOW REGISTER & DRIVE
OVERFLOW (& DISPLAY DISABLE)
RESET
1984-8


LEVEL SHIFT & 50 Ω OUT
MANUAL START-STOP 26 B
AVAILABLE CIRCUIT BOARD CONNECTIONS
4 LINES (BCD)
DCU RESET
10⁰ DCU
N SELECTION SWITCH
To MANUAL START-STOP
DECIMAL & PARAMETER CENTRAL LOGIC
6-LINES
DECIMAL & PARAMETER CODE
FUNCTION SWITCH
FREQ A
RATIO A/B
PERIOD B
TIME A→B
WIDTH B
EVENTS A
DURING B
TOTALIZE A
DCU SIGNAL SELECT and GATING
DECIMAL & PARAMETER CODE
A OR TIME SELECT
WIDTH OR PERIOD SELECT
B OR A→B SELECT
B OR FREQ SELECT
MANUAL SELECT
FREQ A GATE TIME SELECT
RESET BETWEEN POSITIONS
CLOCK RATE SWITCH
DECIMAL & PARAMETER CODE
10 ns SELECT
.1 μs SELECT
1 μs to 1 ms SELECT
CLOCK RATE DISABLE
TIME BASE and SYNC CKT.
1 μs to 10 s
TIME A→B CIRCUIT
MANUAL START-STOP
1 MHz CLOCK
GATE GENERATOR
MAIN GATE
CONTROL SIGNALS
CLEAR
CLEAR
LATCH
RESET
GATE LIGHT DRIVE
OPT. 1 MHz CLOCK
TIMING OUT
100 MHz OSC. & PHASE LOCK LOOP, TIME SELECT
DISPLAY TIME CIRCUIT
DISPLAY TIME CONTROL
MANUAL RESET
SECONDARY BOARD
MAIN BOARD



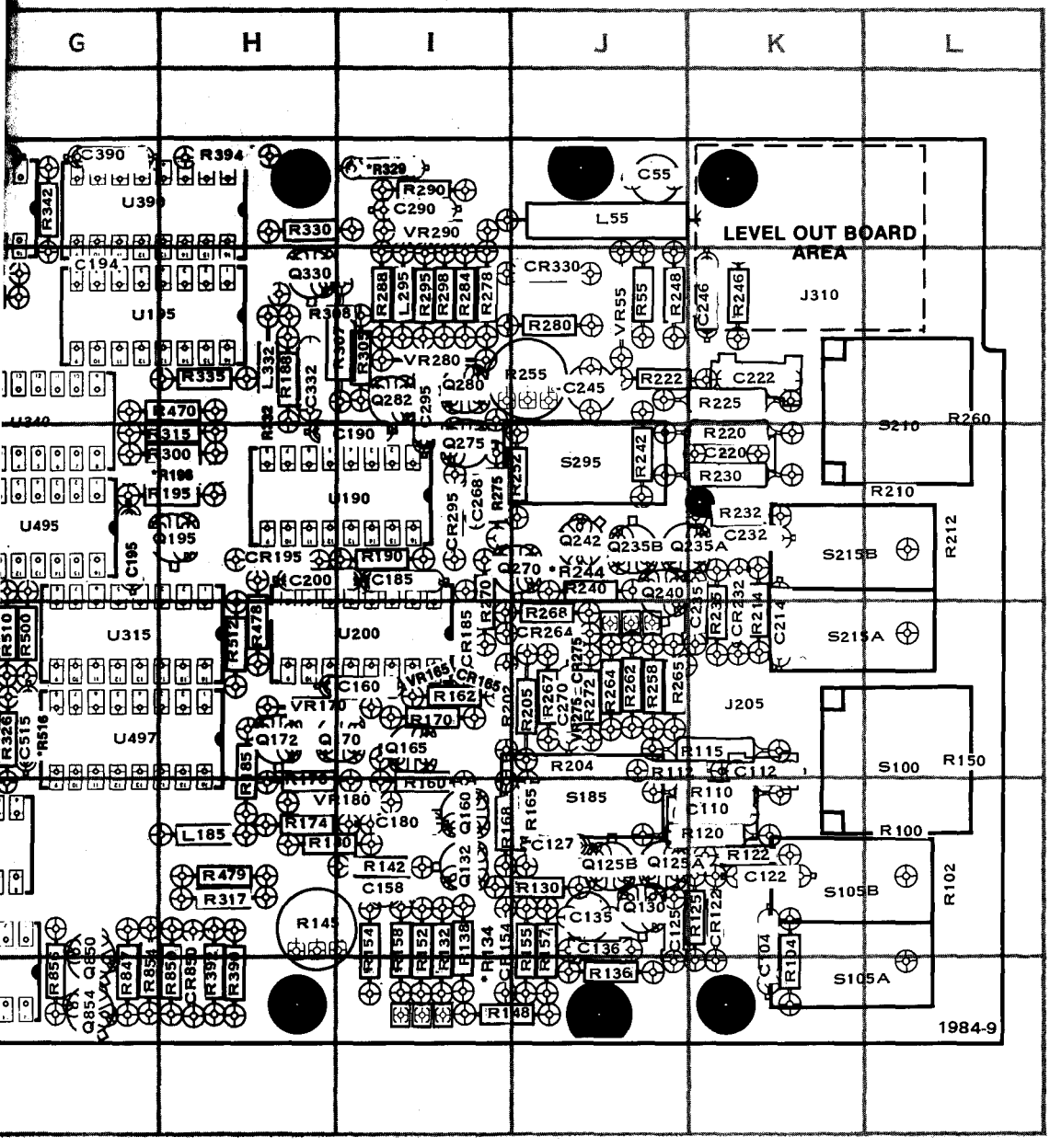
BLOCK DIAGRAM

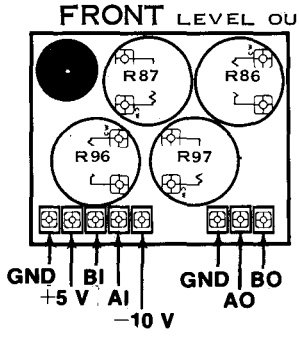
PARTS LOCATIO



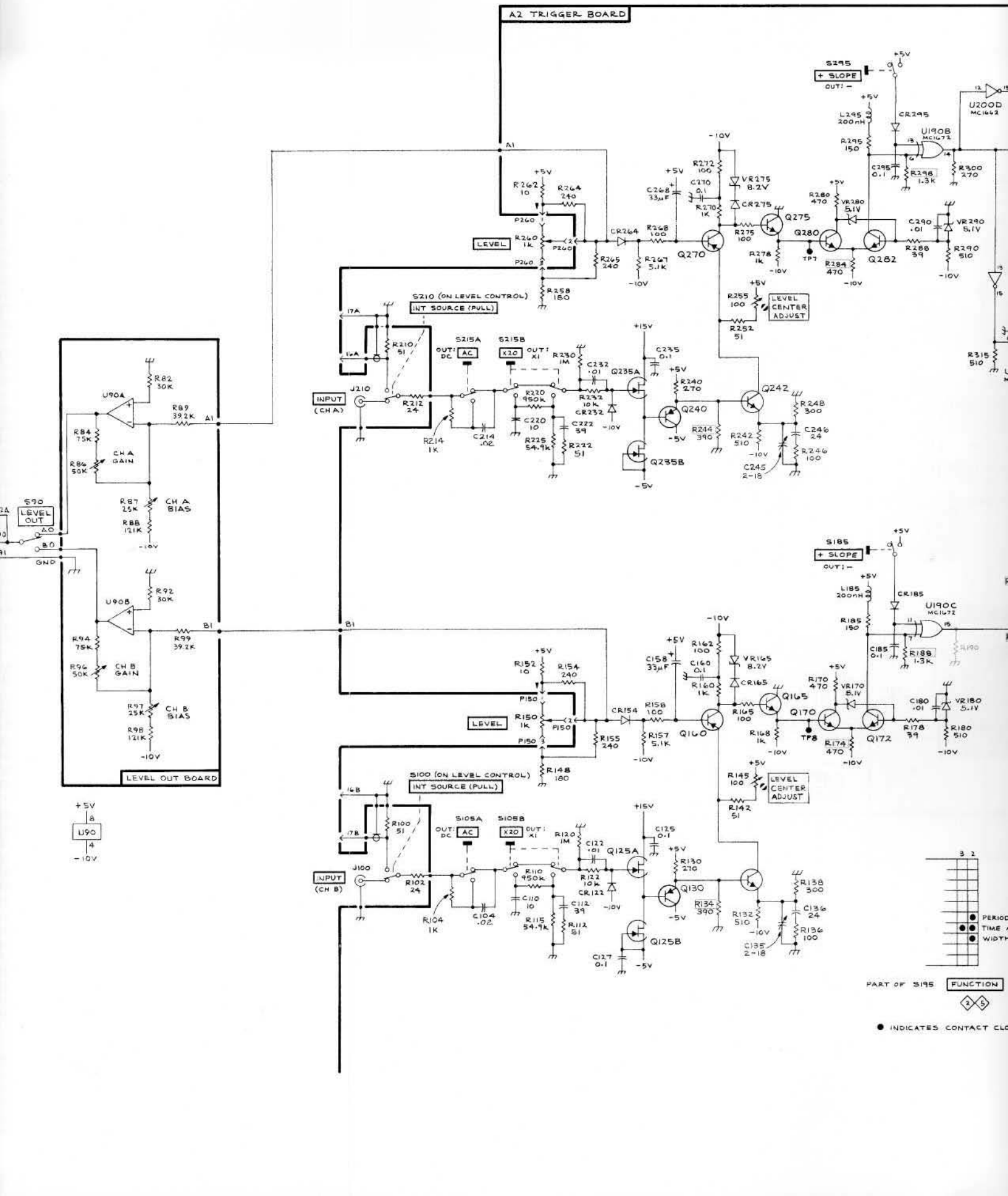
PARTS LOCATION GRID
TRIGGER CIRCUIT BOARD

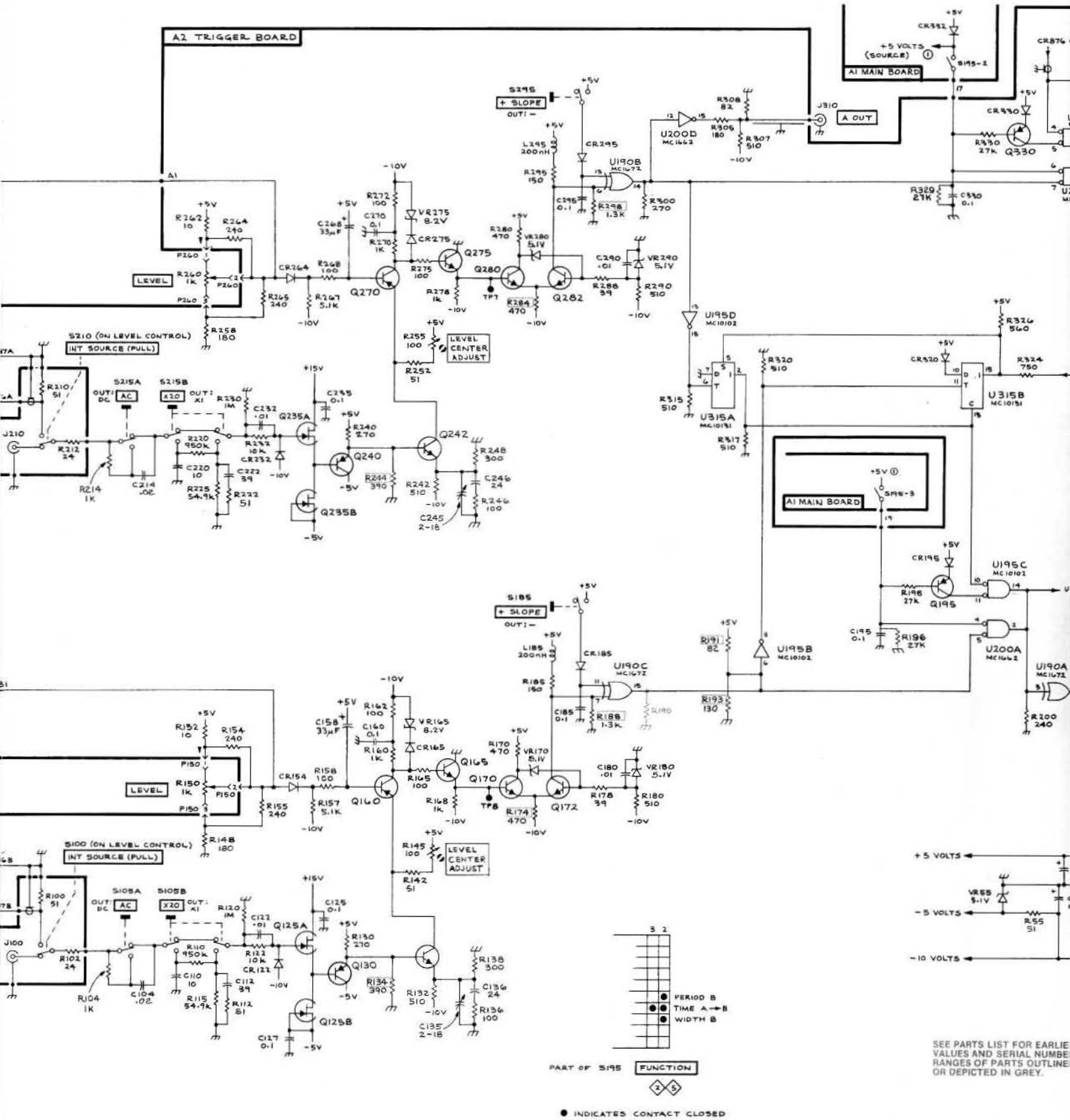
OCATION GRID





CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C50	A4	CR320	F4	Q598	A5	R265	J4	R440	B2	R880	B4
C55	J1	CR330	J2	Q850	G6	R267	J4	R441	B2	R881	B5
C104	K5	CR384	F2	Q854	G6	R268	J4	R445	C2	R885	C5
C110	K5	CR435	A2	Q865	D6	R270	I3	R446	C2	R887	B5
C112	K4	CR440	B2	Q885	C5	R272	J4	R450	B2		
C122	K5	CR445	C2			R275	I3	R451	B2	S100	L4
C125	J5	CR450	B2	R55	J2	R278	I2	R455	C2	S105A	K6
C127	J5	CR455	C2	R100	L5	R280	J2	R456	C2	S105B	K5
C135	J5	CR460	E4	R102	L5	R284	I2	R458	A2	S185	J5
C136	J5	CR494	F4	R104	K6	R288	I2	R460	F4	S210	L2
C158	I5	CR512	D4	R110	K5	R290	I1	R465	F2	S215A	K4
C160	I4	CR513	E4	R112	K4	R295	I2	R468	F3	S215B	K3
C180	I5	CR515	E4	R115	K4	R298	I2	R470	H3	S295	J3
C185	I3	CR580	C4	R120	K5	R300	H3	R478	H4		
C190	I3	CR587	B3	R122	K5	R305	I2	R479	H5	U190	I3
C194	G2	CR588	B4	R125	K5	R307	I2	R482	D4	U195	G2
C195	G3	CR595	A5	R130	J5	R308	H2	R484	C5	U200	I4
C200	H3	CR850	H6	R132	I5	R315	H3	R487	C4	U315	G4
C214	K4	CR870	D6	R136	J6	R317	H5	R490	C4	U340	G2
C220	K3	CR875	C5	R138	I5	R320	F4	R492	C4	U342	F1
C222	K2	CR876	C5	R142	I5	R324	F4	R494	F4	U345	E1
C232	K3			R145	H5	R326	G4	R495	F3	U350	E2
C235	K4	J205	K4	R148	J6	R329	H2	R497	G4	U355	D2
C245	J2	J310	K2	R150	L4	R330	H1	R500	G4	U360	D3
C246	K2			R152	I5	R335	H2	R504	F4	U390	G1
C268	I3	L50	A4	R154	I5	R340	E1	R506	D4	U400	E2
C270	J4	L55	J1	R155	J5	R342	G1	R508	F4	U410	E3
C290	I1	L185	H5	R157	J5	R345	F2	R510	G4	U435	B1
C295	I2	L295	I2	R158	I5	R347	C3	R512	H4	U440	C1
C330	H4	L332	H2	R160	I5	R349	E3	R515	E4	U445	D1
C342	F1	L870	D5	R162	I4	R352	E2	R516	G4	U450	D2
C345	E2			R165	J5	R354	D4	R518	F4	U455	C3
C350	E2	Q125	J5	R168	J5	R356	C3	R520	E4	U495	G3
C372	C3	Q130	J5	R170	I4	R358	B3	R524	D4	U497	G4
C384	F3	Q132	I5	R174	H5	R360	B3	R526	F5	U500	E4
C388	F1	Q160	I5	R178	H5	R362	D4	R530	D4	U580	B4
C390	G1	Q165	I4	R180	I5	R364	B3	R532	D4	U585	B5
C395	D1	Q170	I4	R185	H4	R366	D4	R535	D4	U587	C6
C400	F2	Q172	H4	R188	H2	R368	B3	R537	D4	U590	B4
C425	A4	Q195	H3	R190	I3	R372	C3	R580	A3	U835	E5
C485	C4	Q235	J3	R195	H3	R380	F3	R582	C4	U845	F5
C490	C4	Q240	J3	R196	H3	R382	F2	R590	A3	U855	F6
C515	G4	Q242	J3	R200	E1	R383	F3	R592	C4	U856	E6
C526	E5	Q270	J3	R202	J4	R384	F2	R595	A5	U875	D5
C532	C4	Q275	I3	R204	J4	R388	D1	R596	A4	U880	B5
C537	B4	Q280	I2	R205	J4	R390	H6	R598	A6		
C598	A5	Q282	I2	R210	L3	R392	H6	R835	D4	VR55	J2
C865	D6	Q330	H2	R212	L3	R394	H1	R837	D5	VR165	J4
C866	D6	Q385	F2	R214	K4	R395	D1	R839	F5	VR170	H4
C870	D6	Q420	C2	R220	K3	R400	F2	R842	F5	VR180	I5
C872	D5	Q430	A4	R222	J2	R402	F2	R844	E5	VR275	J4
C875	C4	Q435	B2	R225	K2	R406	E4	R847	G6	VR280	I2
		Q440	B2	R232	K3	R408	E4	R850	H6	VR290	I1
CR122	K5	Q445	C2	R235	K4	R410	E4	R854	H6		
CR154	J5	Q450	B2	R240	J3	R412	E4	R856	G6		
CR165	I4	Q455	C2	R242	J3	R415	E4	R860	E6		
CR185	I4	Q480	C4	R246	K2	R416	C2	R862	E6		
CR195	H3	Q485	C4	R248	J2	R418	D2	R863	E6		
CR232	K4	Q490	C4	R252	J3	R420	A3	R865	E6		
CR264	J4	Q506	D4	R255	J2	R422	C2	R867	D6		
CR275	I4	Q515	E4	R258	J4	R425	A4	R870	D6		
CR295	I3	Q535	D4	R260	L2	R426	A4	R872	D5		
		Q595	A6	R262	J4	R430	C3	R875	C5		
				R264	J4	R435	B2	R876	B5		
						R436	B2				


A2 TRIGGER BOARD
LEVEL OUT BOARD
S295
+ SLOPE
OUT: −
U200D
MC1662
L295
200nH
CR295
U190B
MC1672
R295
150
C295
0.1
R298
1.3K
R300
270
R272
100
C270
0.1
R270
1K
VR275
8.2V
CR275
Q275
R275
100
R278
1K
Q280
TP7
Q270
R280
470
VR280
5.1V
C290
.01
VR290
5.1V
R288
39
R290
510
Q282
R284
470
R268
100
CR264
R262
10
R264
240
C268
33μF
P260
LEVEL
R260
1K
R265
240
R267
5.1K
R258
180
R255
100
LEVEL
CENTER
ADJUST
R252
51
R315
510
S210 (ON LEVEL CONTROL)
INT SOURCE (PULL)
17A
16A
R210
51
S215A
OUT:
DC
AC
S215B
X20
OUT:
X1
R230
1M
C232
.01
Q235A
C235
0.1
INPUT
(CH A)
J210
R212
24
R214
1K
C214
.02
R220
950K
C220
10
R225
54.9K
C222
39
R222
51
CR232
R232
10K
R240
270
Q240
Q242
R244
390
R242
510
R248
300
C246
24
R246
100
C245
2-18
Q235B
S90
LEVEL
OUT
A0
B0
GND
U90A
R82
30K
R89
39.2K
A1
R84
75K
R86
50K
CH A
GAIN
R87
25K
CH A
BIAS
R88
121K
-10V
U90B
R92
30K
R94
75K
R96
50K
CH B
GAIN
R99
39.2K
B1
R97
25K
CH B
BIAS
R98
121K
-10V
+5V
U90
8
4
-10V
S185
+ SLOPE
OUT: −
U190C
MC1672
L185
200nH
CR185
R185
150
C185
0.1
R188
1.3K
R190
R162
100
C158
33μF
C160
0.1
R160
1K
VR165
8.2V
CR165
Q165
R165
100
R168
1K
Q170
TP8
R170
470
VR170
5.1V
C180
.01
VR180
5.1V
R178
39
R180
510
Q172
R174
470
R152
10
R154
240
P150
LEVEL
R150
1K
R155
240
R157
5.1K
R158
100
CR154
Q160
R148
180
R145
100
LEVEL
CENTER
ADJUST
R142
51
S100 (ON LEVEL CONTROL)
INT SOURCE (PULL)
16B
17B
R100
51
S105A
OUT:
DC
AC
S105B
X20
OUT:
X1
R120
1M
C122
.01
Q125A
C125
0.1
INPUT
(CH B)
J100
R102
24
R104
1K
C104
.02
R110
950K
C110
10
R115
54.9K
C112
39
R112
51
CR122
R122
10K
R130
270
Q130
R134
390
R132
510
R138
300
C136
24
R136
100
C135
2-18
Q125B
C127
0.1
3 2
PERIOD
TIME
WIDTH
PART OF S195
FUNCTION
4
5
● INDICATES CONTACT CLO



1984-10

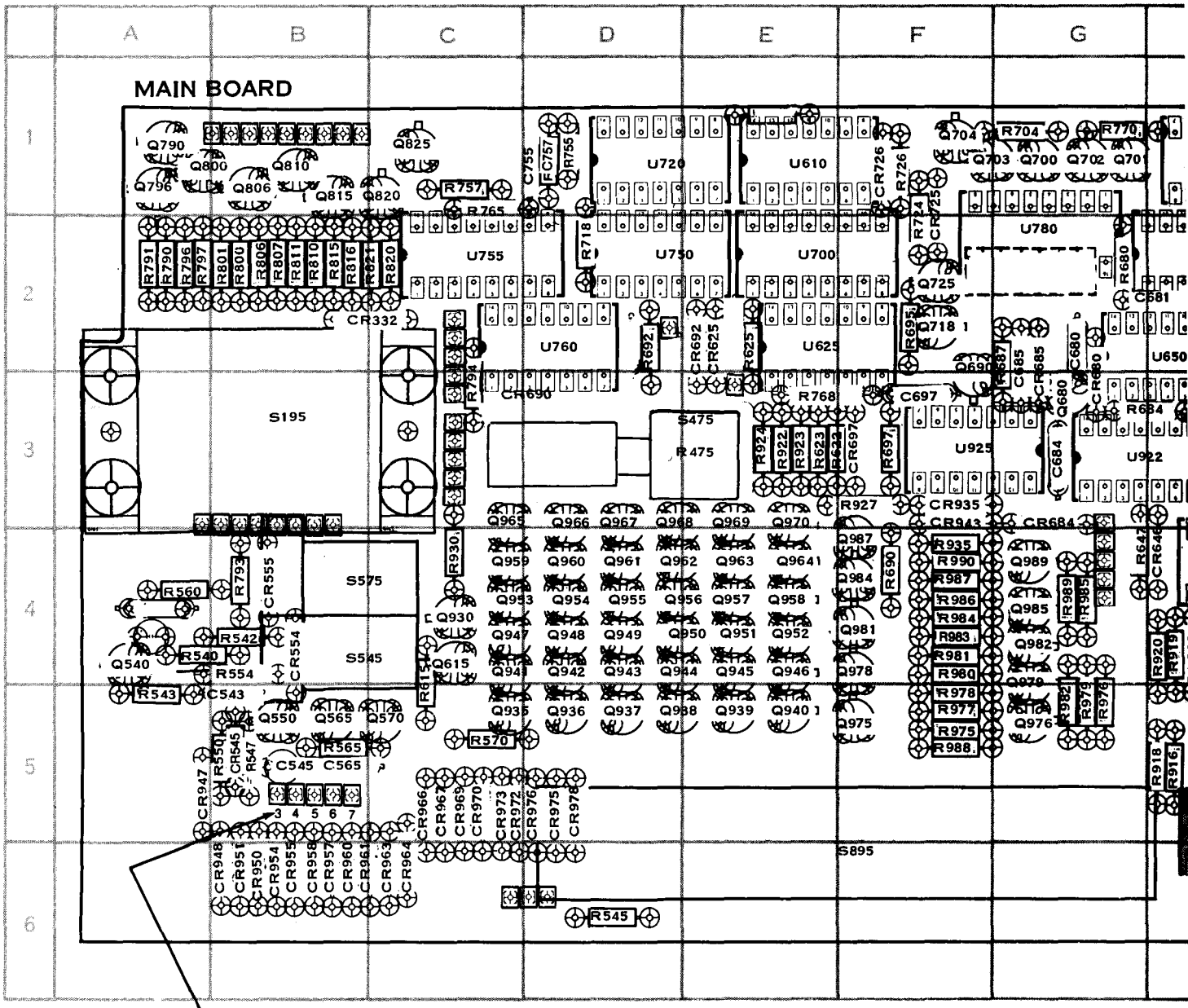
REV. B, AUG 1977

PARTS LOCATION GRID
MAIN CIRCUIT BOARD

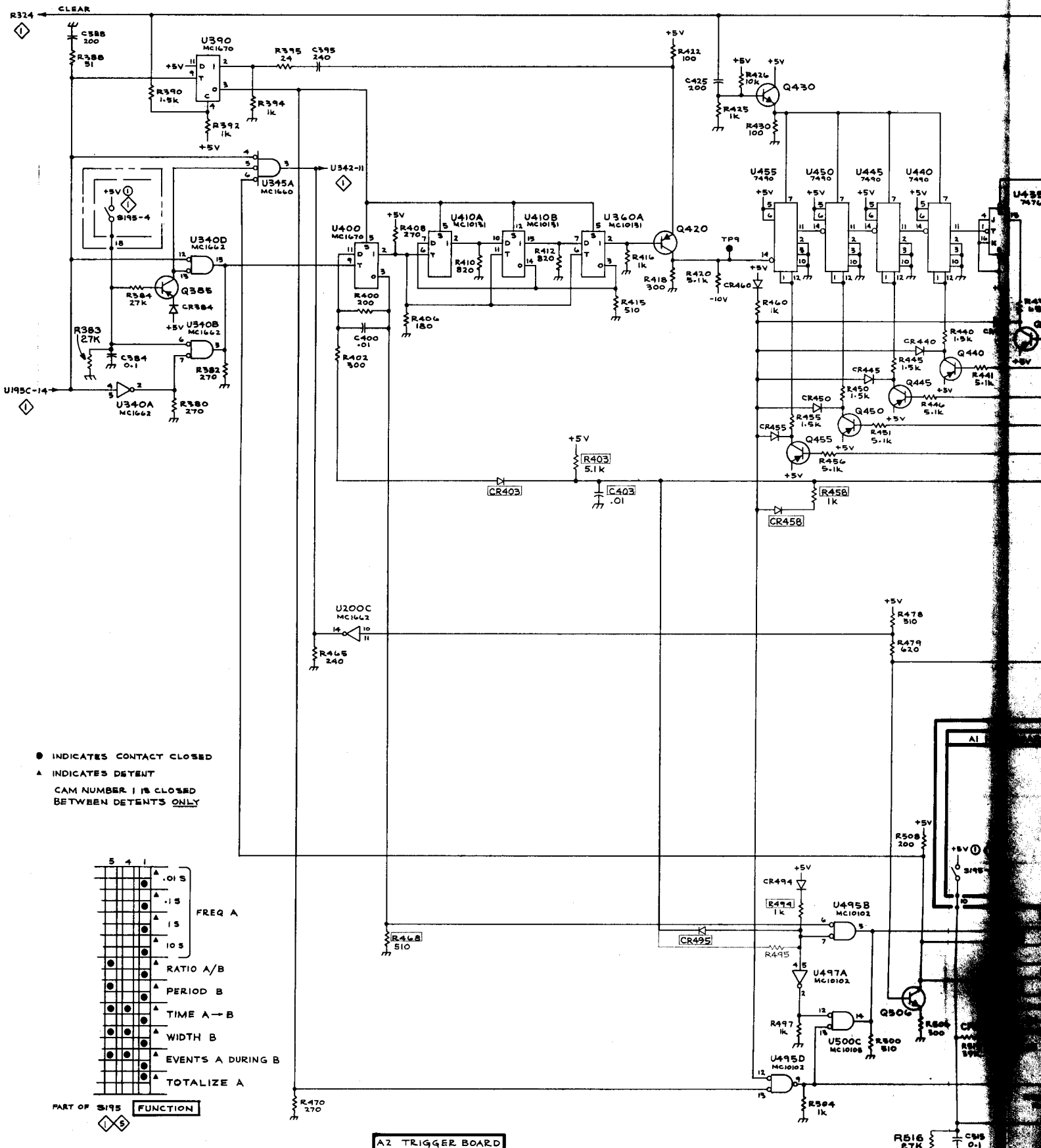
INSTALL FOR OPTION 1 ONLY

REMOVE FOR OPTION 1

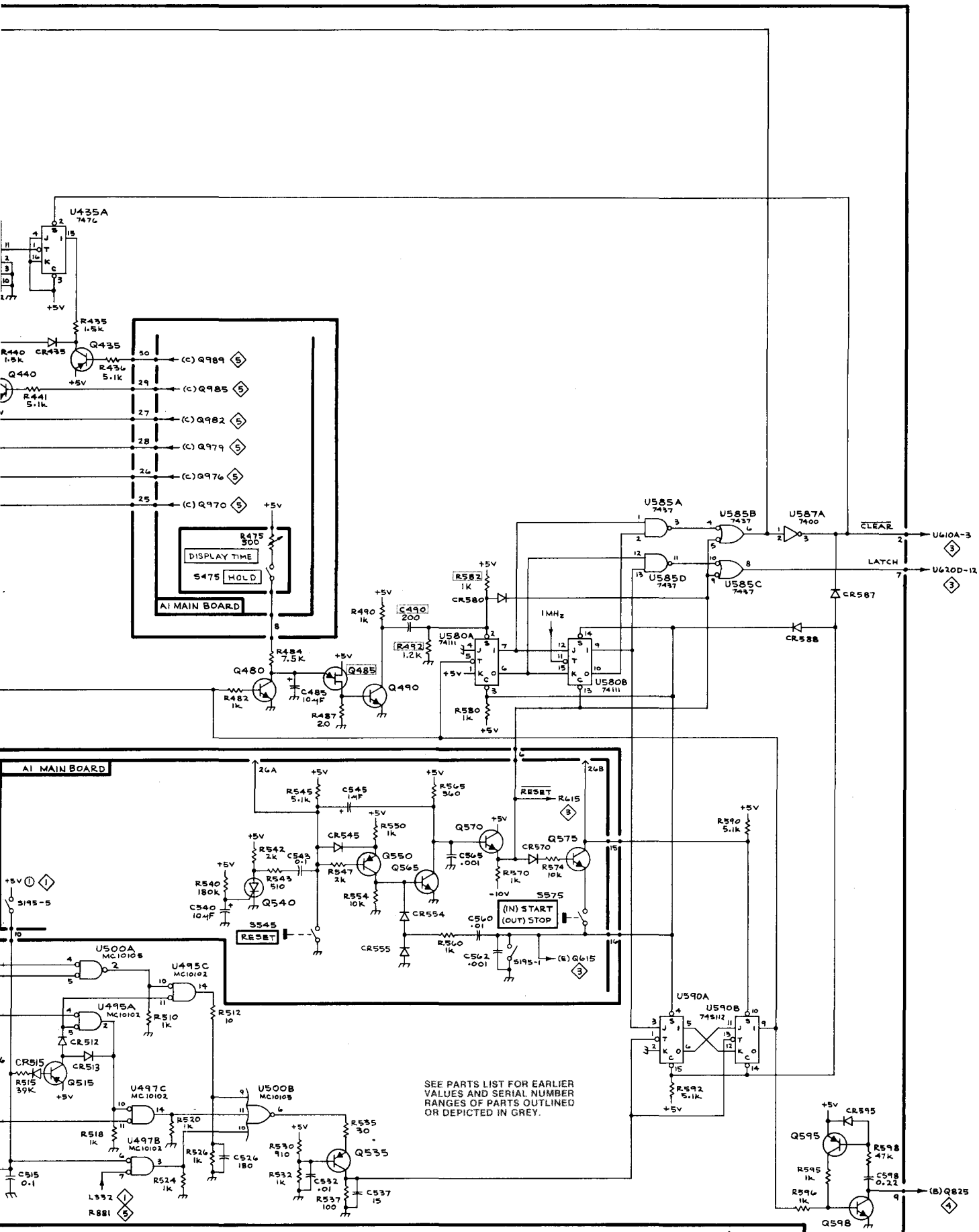
PARTS LOCATIOI



CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C17	J4	CR957	B6	Q953	C4	R629	J4	R891	J3	U900	I5
C20	K5	CR958	B6	Q954	D4	R632	L2	R895	H4	U901	H5
C35	K5	CR960	B6	Q955	D4	R635	K3	R897	H4	U920	H3
C40	M4	CR961	B6	Q956	D4	R637	I1	R900	I5	U922	G3
C60	L4	CR963	C6	Q957	E4	R640	L2	R902	I5	U925	F3
C65	L4	CR964	C6	Q958	E4	R642	K2	R906	I5		
C75	J5	CR966	C5	Q959	C4	R644	K2	R910	I5	VR34	J4
C80	K4	CR967	C5	Q960	D4	R647	G4	R912	H4	VR42	K5
C81	L4	CR969	C5	Q961	D4	R655	K2	R914	H4		
C543	B5	CR970	C5	Q962	D4	R656	K2	R916	H5		
C545	B5	CR972	C5	Q963	E4	R660	K2	R918	H5		
C565	B5	CR973	C5	Q964	E4	R662	K2	R919	H4		
C620	J3	CR975	D5	Q965	C3	R664	L2	R920	H4		
C630	J4	CR976	D5	Q966	D3	R666	L2	R922	E3		
C632	K1	CR978	D5	Q967	D3	R668	L1	R923	E3		
C664	L1			Q968	D3	R670	K2	R924	E3		
C668	L1	L25	L6	Q969	E3	R672	L2	R927	F3		
C680	G2			Q970	E3	R680	G2	R930	C4		
C681	H2	Q42	L5	Q975	F5	R684	G3	R935	F4		
C684	G3	Q65	L5	Q976	G5	R687	G2	R975	F5		
C685	G2	Q68	L5	Q978	F4	R690	F4	R976	G5		
C697	F3	Q80	L4	Q979	G4	R692	D2	R977	F5		
C710	I2	Q540	A4	Q981	F4	R695	F2	R978	F5		
C722	L2	Q550	B5	Q982	G4	R697	F3	R979	G5		
C730	I3	Q565	B5	Q984	F4	R704	G1	R980	F4		
C732	I3	Q570	C5	Q985	G4	R710	K3	R981	F4		
C744	I2	Q575	L6	Q987	F4	R712	K3	R982	G5		
C746	K2	Q615	C4	Q989	G4	R714	H2	R983	F4		
C755	D1	Q640	L2			R718	D2	R984	F4		
C757	D1	Q655	L2	R10	L4	R720	M2	R985	G4		
C891	K3	Q660	L2	R12	J4	R722	L1	R986	F4		
C904	J4	Q670	L2	R14	J4	R724	F2	R987	F4		
C906	J5	Q680	G3	R16	L4	R726	F1	R988	F5		
CR67	K5	Q690	F2	R17	L3	R730	I2	R989	G4		
CR68	K5	Q700	G1	R18	K4	R732	H2	R990	F4		
CR332	B2	Q701	G1	R30	K5	R735	I2				
CR545	B5	Q702	G1	R31	K5	R740	K2	S195	B3		
CR554	B4	Q703	F1	R34	J4	R742	J2	S475	E3		
CR555	B4	Q704	F1	R35	K5	R744	J2	S545	B4		
CR570	K6	Q718	F2	R42	K5	R746	H2	S575	B4		
CR610	K3	Q725	F2	R60	L4	R755	D1	S895	F6		
CR612	K3	Q790	A1	R62	L4	R757	C1	S900	H5		
CR614	L3	Q796	A1	R68	K5	R765	C1				
CR615	I4	Q800	A1	R72	L5	R768	E3	U10	K4		
CR625	E2	Q806	B1	R75	L5	R770	G1	U30	K4		
CR630	I4	Q810	B1	R78	L4	R774	M3	U610	E1		
CR646	H4	Q815	B1	R80	K4	R775	L3	U620	J3		
CR647	I2	Q820	C1	R81	K4	R776	M2	U625	E2		
CR680	G3	Q825	C1	R85	K5	R777	L3	U630	I3		
CR684	G3	Q930	C4	R475	E3	R790	A2	U650	H2		
CR685	G2	Q935	C5	R540	A4	R791	A2	U652	J2		
CR690	D3	Q936	D5	R542	B4	R793	B4	U655	J1		
CR692	E2	Q937	D5	R543	A5	R794	C3	U657	K1		
CR697	F3	Q938	D5	R545	D6	R796	A2	U675	I1		
CR725	F2	Q939	E5	R547	B5	R797	A2	U676	I2		
CR726	F1	Q940	E5	R550	B5	R800	B2	U678	H1		
CR895	I4	Q941	C4	R554	B4	R801	B2	U679	H2		
CR896	I4	Q942	D4	R560	A4	R806	B2	U700	E2		
CR912	H4	Q943	D4	R565	B5	R807	B2	U715	J2		
CR914	H4	Q944	D4	R570	C5	R810	B2	U720	D1		
CR935	F3	Q945	E4	R574	K6	R811	B2	U750	D2		
CR943	F3	Q946	E4	R605	I4	R815	B2	U755	C2		
CR947	A5	Q947	C4	R606	I4	R816	B2	U760	D2		
CR948	B6	Q948	D4	R615	C4	R820	C2	U765	K2		
CR950	B6	Q949	D4	R622	E3	R821	B2	U780	G2		
CR951	B6	Q950	D4	R623	E3	R890	J3	U895	H4		
CR954	B6	Q951	E4	R625	E2						
CR955	B6	Q952	E4	R628	J4						



A2 TRIGGER BOARD



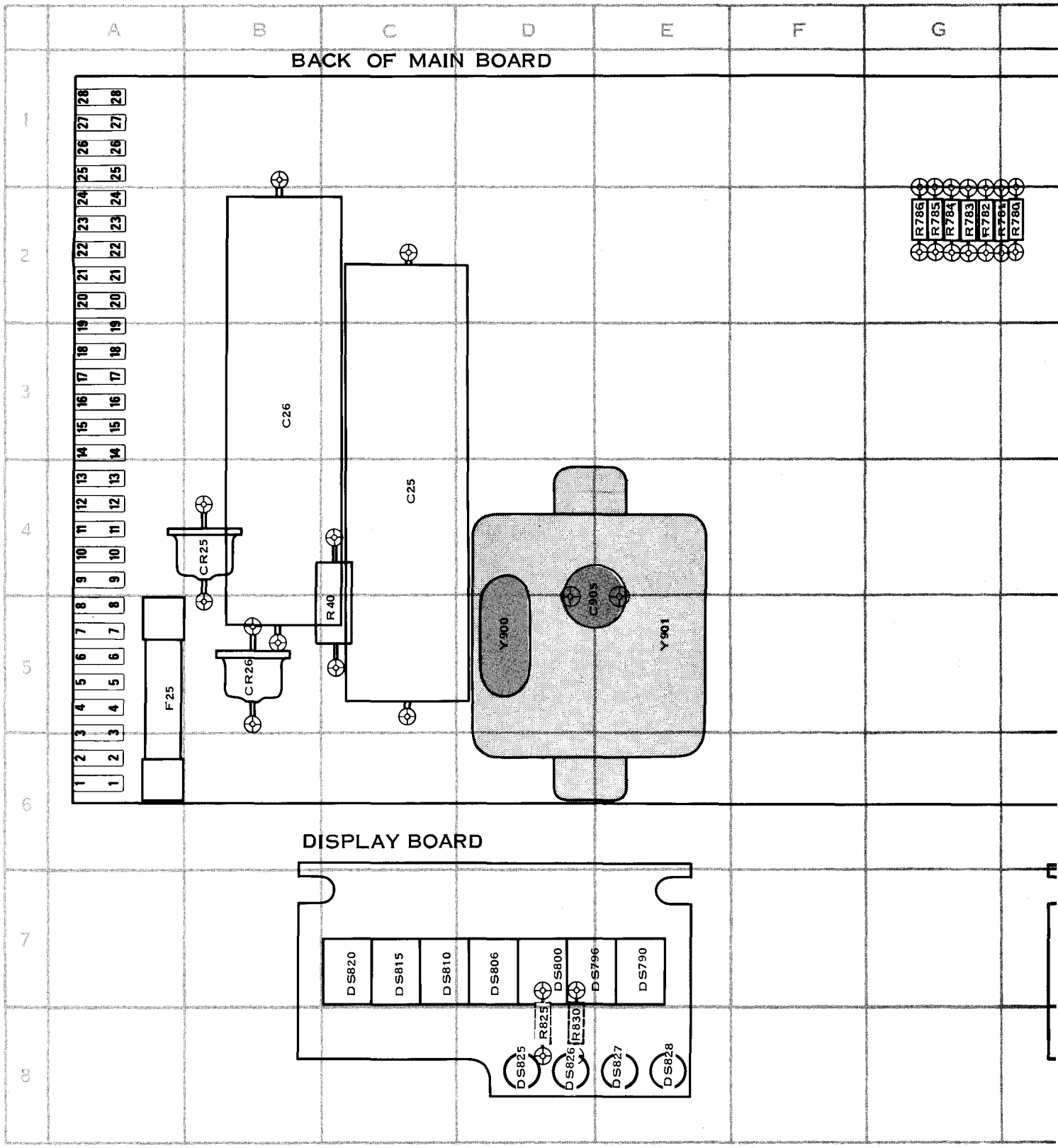
GATE AND CONTROL LOGIC, AVERAGING DIVIDER, RESET ◇2 DEM 0774

INSTALL FOR OPTION 1 ONLY

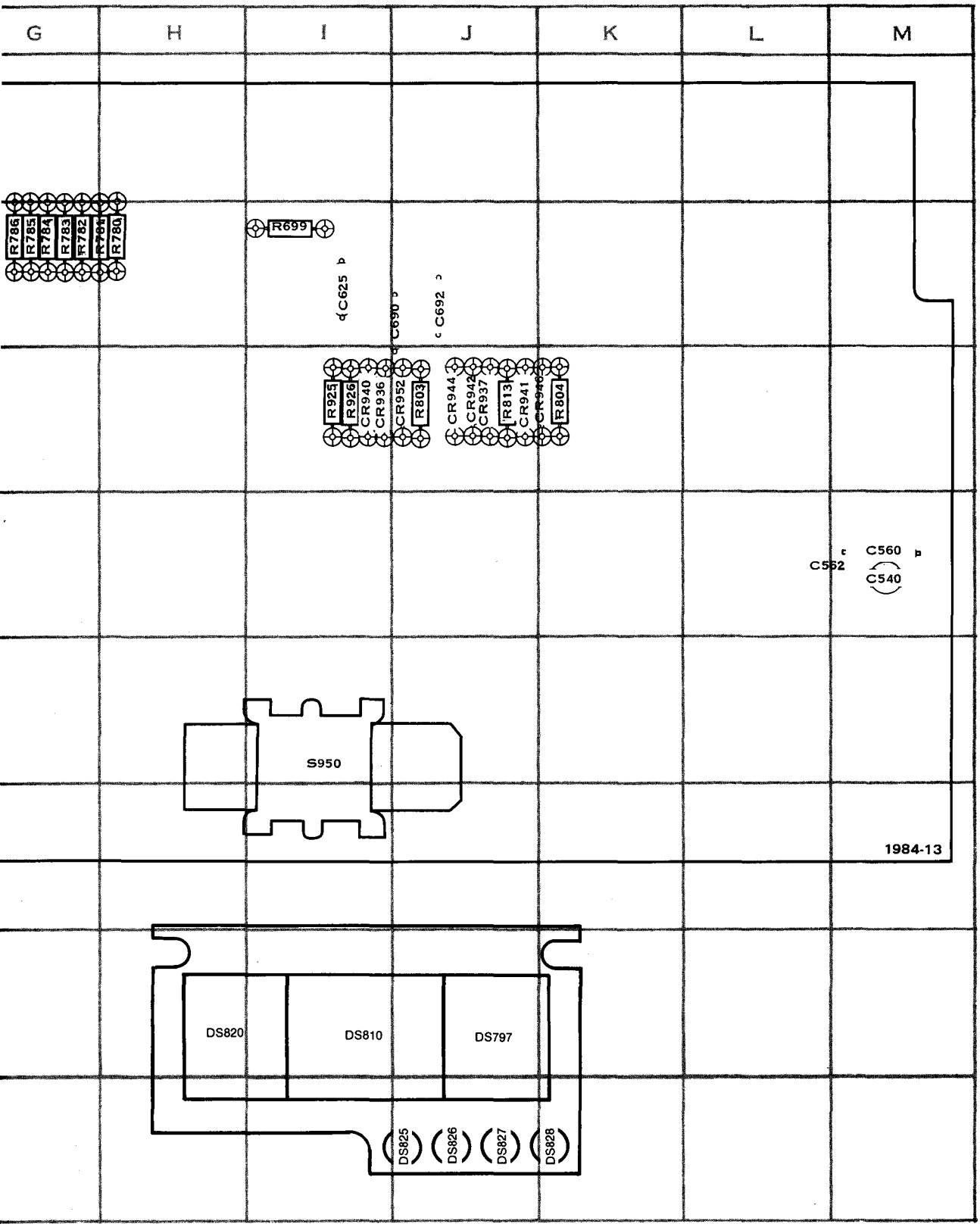
REMOVE FOR OPTION 1

PARTS LOCATIO

MAIN BOARD (BACK) AND
DISPLAY BOARD



LOCATION GRID



CKT NO	GRID LOC
C25	C4
C26	B3
C540	M4
C560	M4
C562	M3
C625	I2
C690	J2
C692	J2
C905	D5
CR25	B4
CR26	B5
CR936	I3
CR937	J3
CR940	I3
CR941	J3
CR942	J3
CR944	J3
CR946	K3
CR952	J3
F25	A5
R40	C5
R699	I2
R780	H2
R781	G2
R782	G2
R783	G2
R784	G2
R785	G2
R786	G2
R803	J3
R804	K3
R813	J3
R925	I3
R926	I3
S950	I5
Y901	D5
Y901	E5

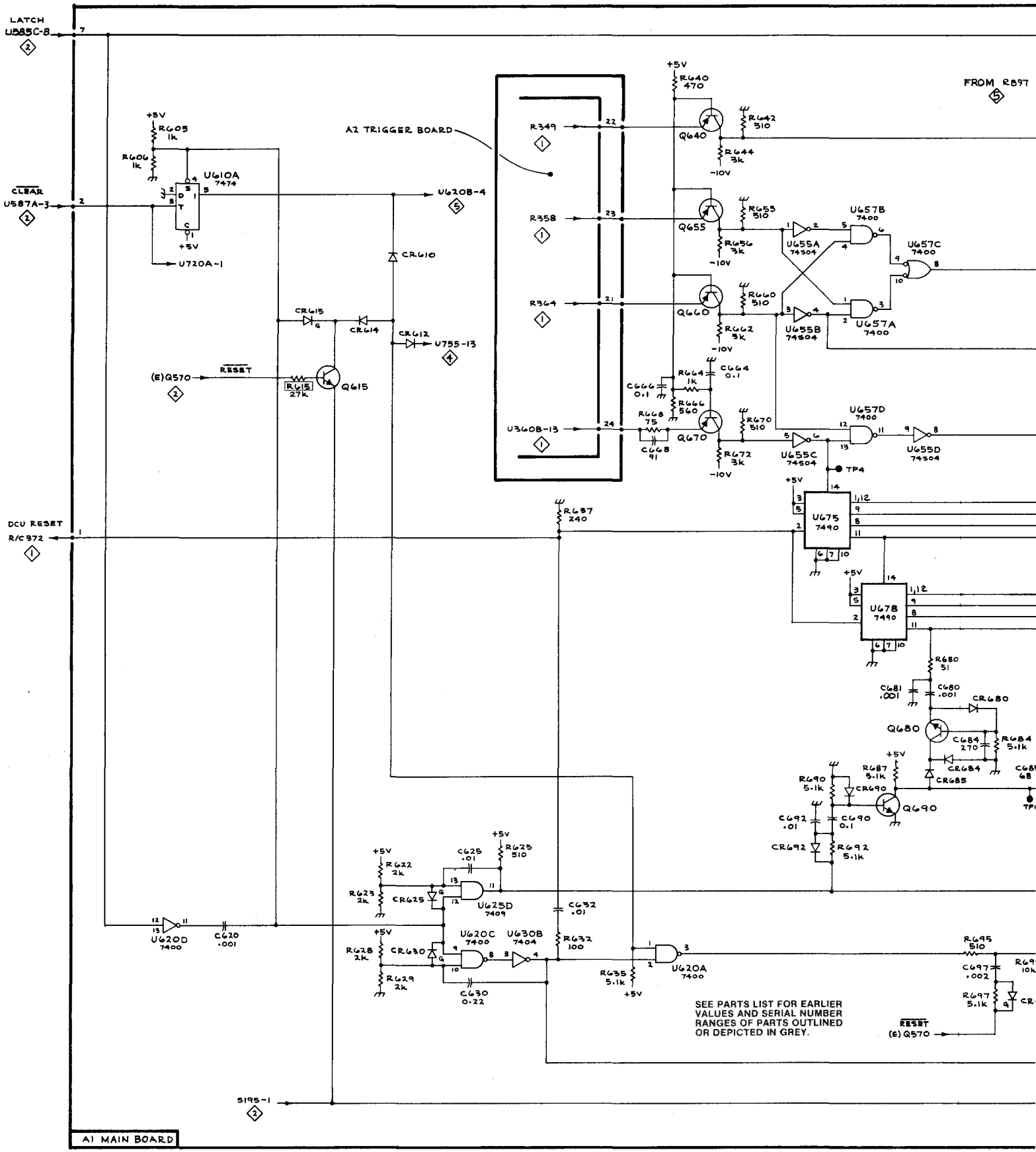
MAIN BOARD (BACK)

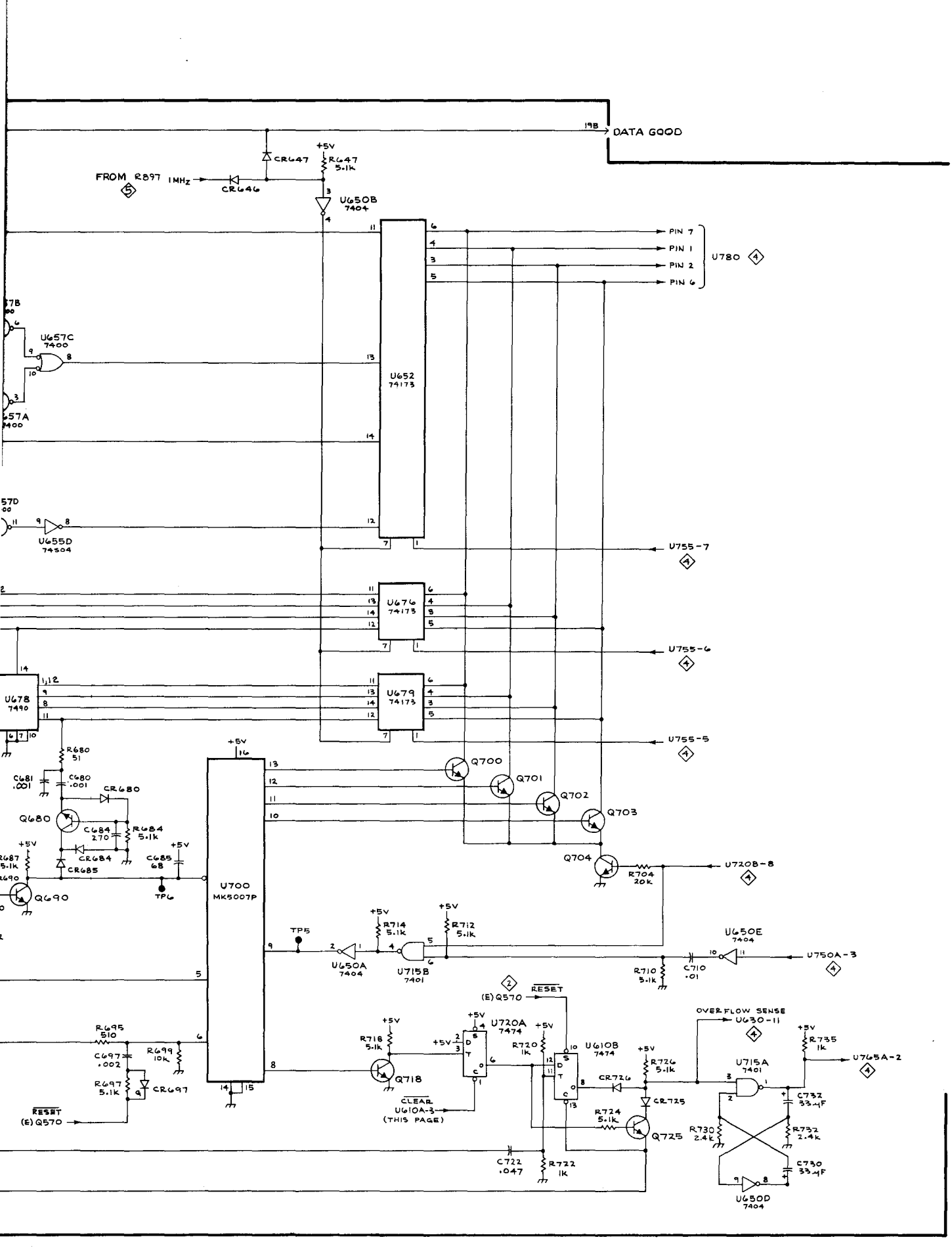
DS790	E7
DS796	D7
DS800	D7
DS806	D7
DS810	C7
DS815	C7
DS820	C7
DS825	D8
DS826	D8
DS827	E8
DS828	E8
R825	D8
R830	D8

DISPLAY BOARD
SN B010879 & BELOW

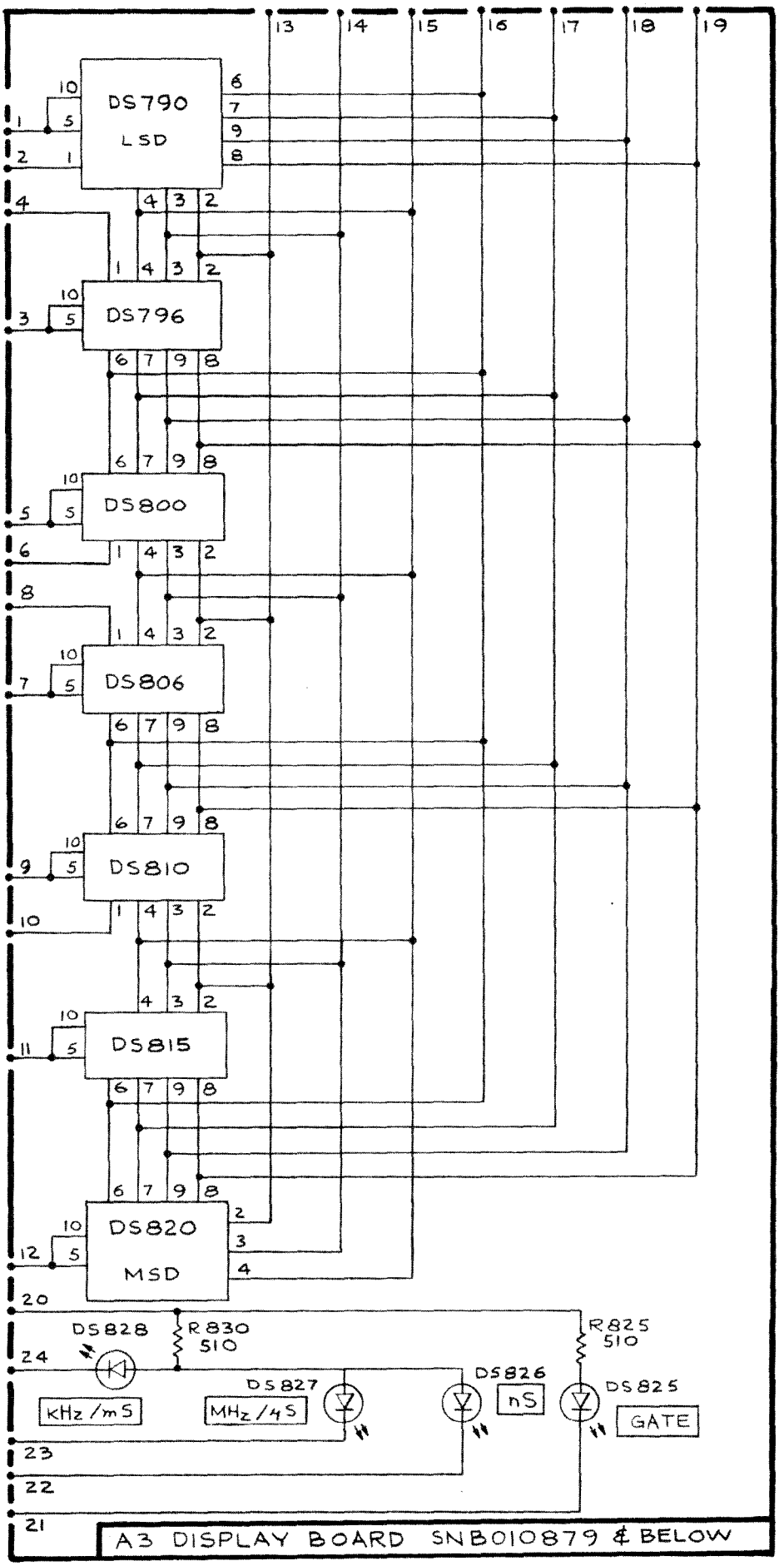
CKT NO	GRID LOC
DS797	J7
DS810	I7
DS820	H7
DS825	J8
DS826	J8
DS827	J8
DS828	K8

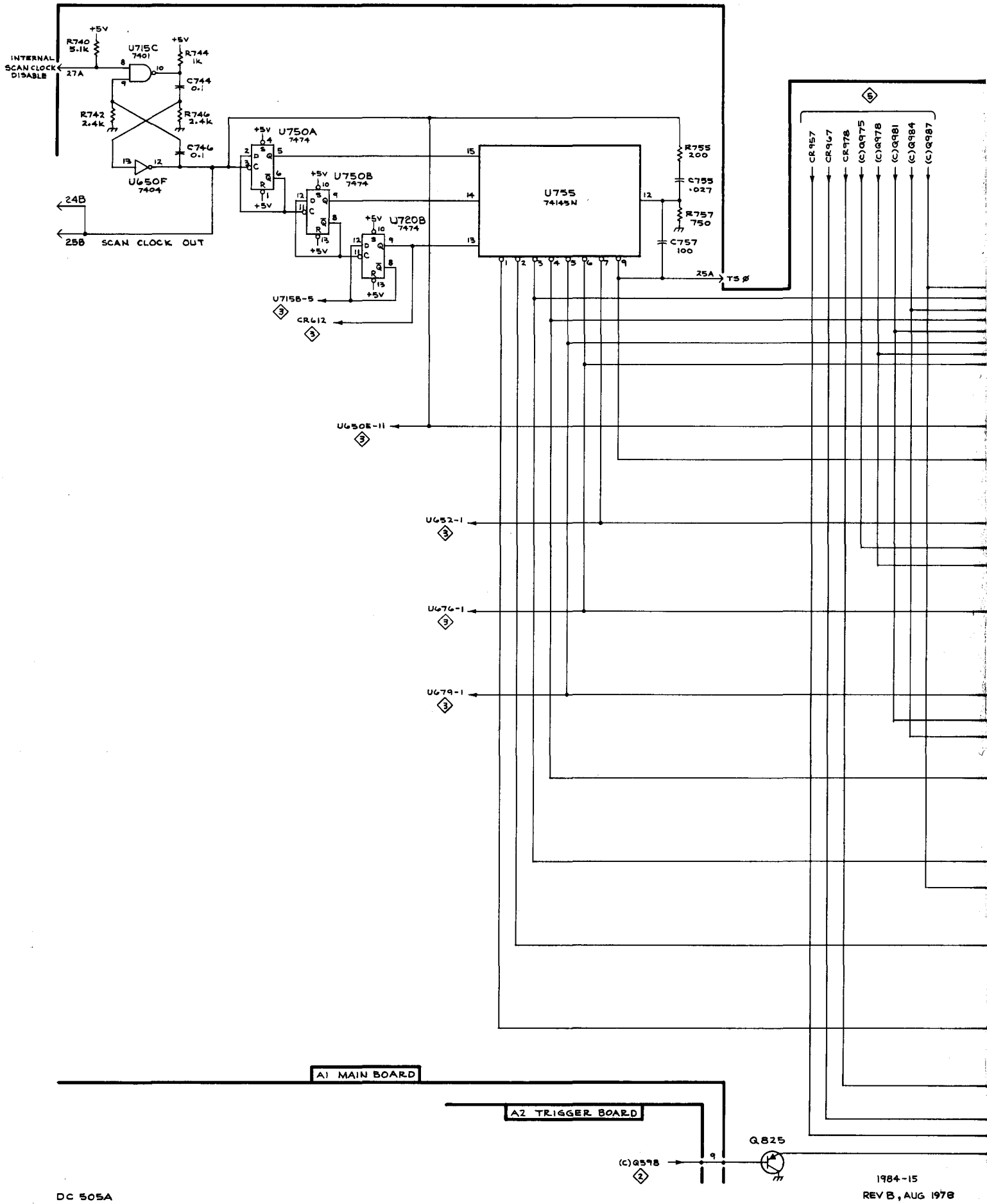
DISPLAY BOARD
SN B010880 & ABOVE


LATCH U585C-8
CLEAR U587A-3
DCU RESET R/C372
A2 TRIGGER BOARD
FROM R897
U610A 7474
U620B-4
U720A-1
CR610
CR615
CR614
CR612
U755-13
(E)Q570
RESET
R615 27k
Q615
R605 1k
R606 1k
R640 470
Q640
R642 510
R644 3k
R349
R358
R364
U360B-13
Q655
R655 510
R656 3k
Q660
R660 510
R662 3k
Q670
R670 510
R672 3k
R664 1k
R666 560
R668 75
C664 0.1
C666 0.1
C668 91
U655A 74S04
U655B 74S04
U655C 74S04
U655D 74S04
U657A 7400
U657B 7400
U657C 7400
U657D 7400
TP4
R687 240
U675 7490
U678 7490
R680 51
C680 .001
C681 .001
CR680
Q680
R684 5.1k
C684 270
CR684
CR685
R687 5.1k
R690 5.1k
CR690
Q690
C690 0.1
C692 .01
CR692
R692 5.1k
R622 2k
R623 2k
CR625
U625D 7409
C625 .01
R625 510
C632 .01
U620D 7400
C620 .001
U620C 7400
U630B 7404
R628 2k
CR630
R629 2k
C630 0.22
R632 100
R635 5.1k
U620A 7400
R695 510
C697 .002
R697 5.1k
S195-1
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.
A1 MAIN BOARD



MOS INTERFACE, 10¹-10⁶ DCU AND LATCHES, AND OVERFLOW 3 DEM 0774


13
14
15
16
17
18
19
DS790
LSD
DS796
DS800
DS806
DS810
DS815
DS820
MSD
DS828
R830
510
R825
510
DS827
DS826
DS825
kHz /mS
MHz /4S
nS
GATE
A3 DISPLAY BOARD SNB010879 & BELOW



DC 505A

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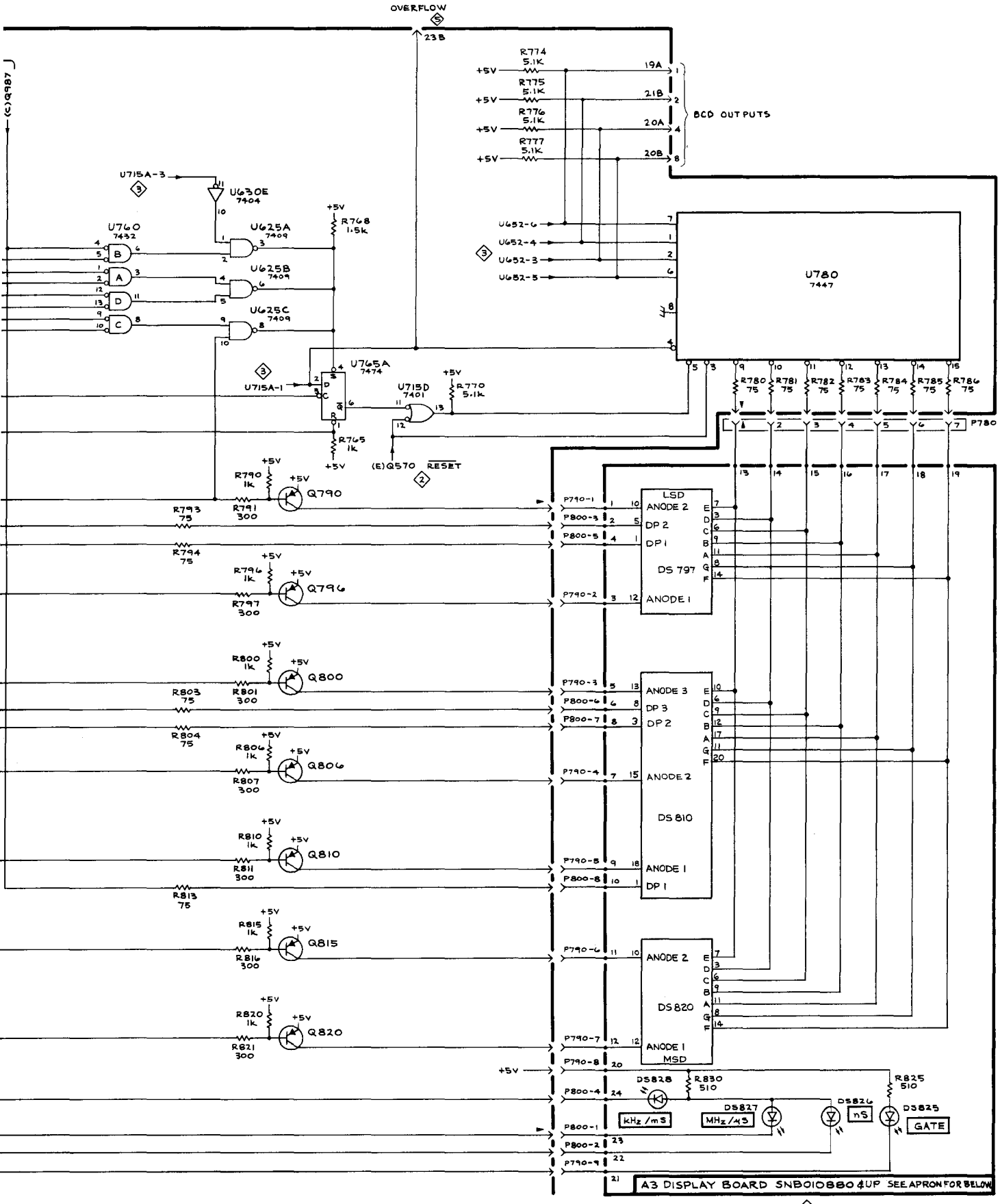
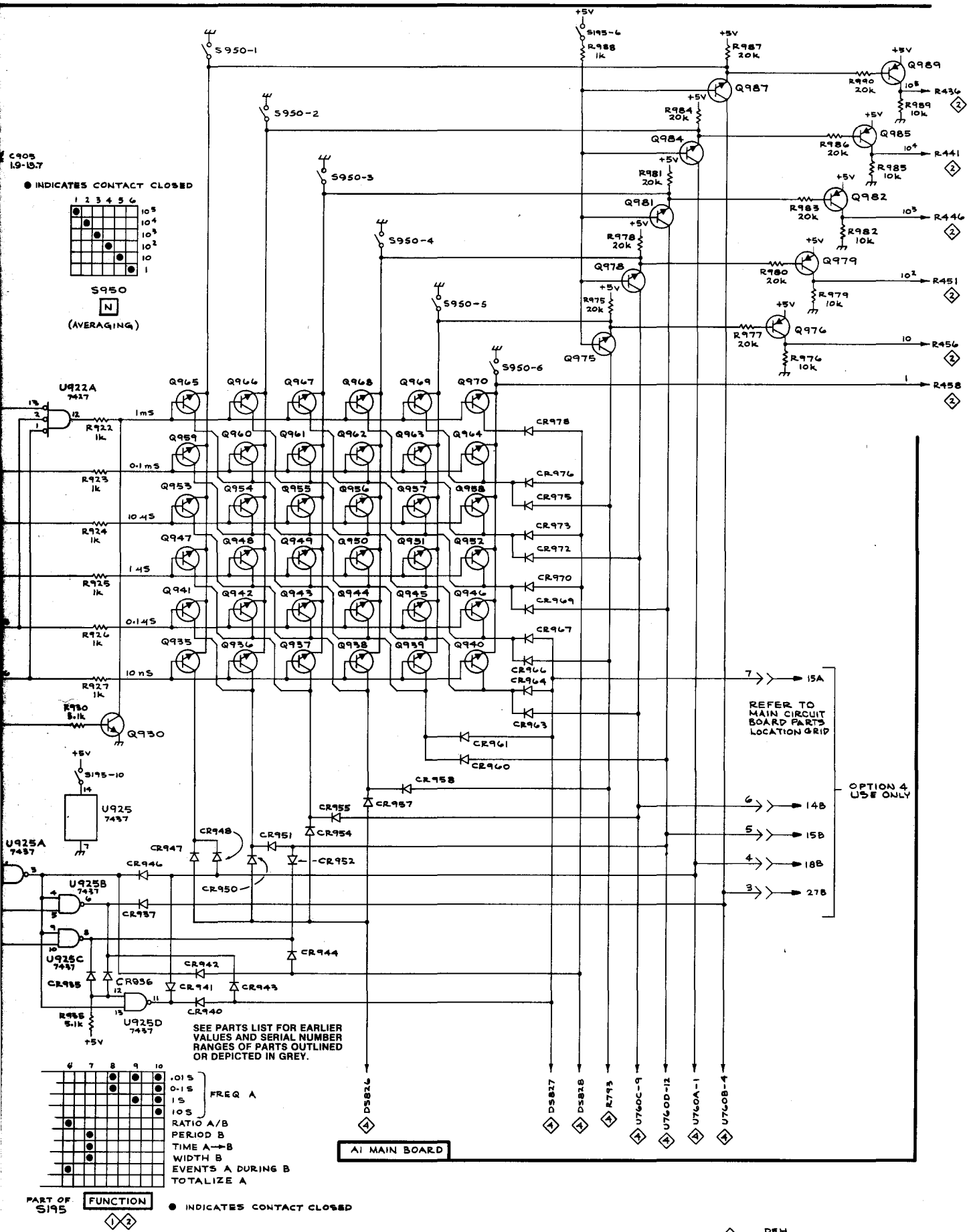


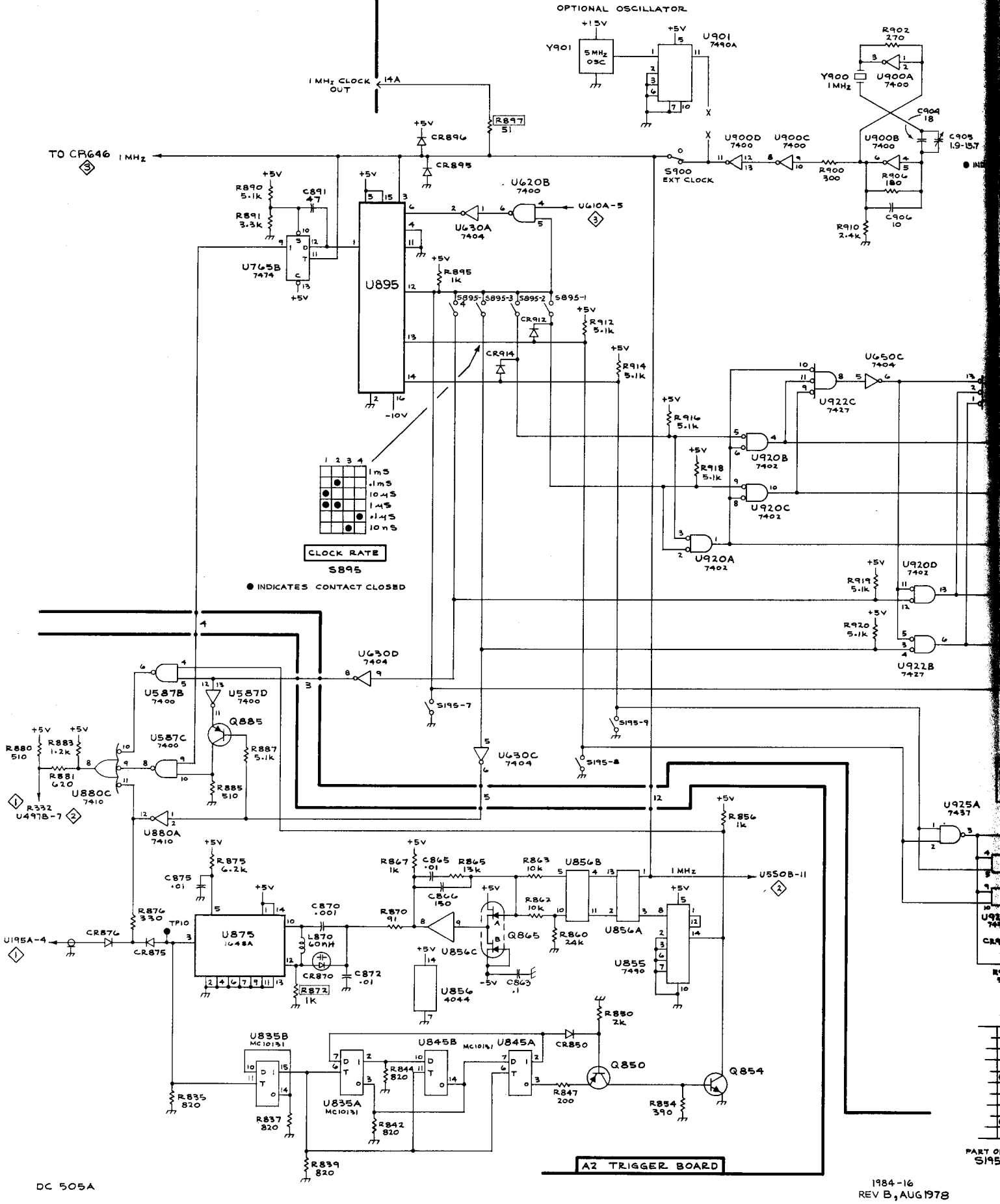
TIME SLOT GENERATOR, LEADING ZERO SUPPRESSION, DISPLAY ◇4 DEH 0774

(C)9987

© 1978



Time Base, Phase Lock Loop, Decimal Point and Parameter Matrix 5 DEM 0774


OPTIONAL OSCILLATOR
Y901
5 MHz OSC
U901 7490A
Y900 1 MHz
U900A 7400
U900B 7400
U900C 7400
U900D 7400
S900 EXT CLOCK
1 MHz CLOCK OUT
TO CR646
CR896
CR895
R897 51
R890 5.1k
R891 3.3k
C891 47
U765B 7474
U620B 7400
U630A 7404
U895
S895-4 S895-3 S895-2 S895-1
CR912
CR914
R895 1k
R912 5.1k
R914 5.1k
-10V
CLOCK RATE
S895
● INDICATES CONTACT CLOSED
1mS
.1mS
10μS
1μS
.1μS
10nS
U650C 7404
U922C 7427
R916 5.1k
R918 5.1k
U920B 7402
U920C 7402
U920A 7402
U920D 7402
R919 5.1k
R920 5.1k
U922B 7427
U630D 7404
U630C 7404
S195-7
S195-9
S195-8
U587B 7400
U587D 7400
U587C 7400
Q885
R880 510
R883 1.2k
R881 620
R887 5.1k
R885 510
U880C 7410
U880A 7410
R332
U875 1648A
R875 6.2k
C875 .01
R876 330
TP10
CR876
CR875
U195A-4
C870 .001
L870 60nH
CR870
R872 1K
C872 .01
R867 1k
C865 .01
R865 13k
C866 150
R870 91
U856C
R863 10k
U856B
R862 10k
Q865
R860 24k
U856A
C863 .1
U856 4044
U855 7490
R856 1k
U925A 7437
1 MHz
U550B-11
R850 2k
CR850
Q850
Q854
U835B MC10131
U845B MC10131
U845A
U835A MC10131
R844 820
R847 200
R854 390
R835 820
R837 820
R842 820
R839 820
A2 TRIGGER BOARD
DC 505A
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REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000	Part first added at this serial number
00X	Part removed after this serial number

FIGURE AND INDEX NUMBERS

Items in this section are referenced by figure and index numbers to the illustrations.

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

1 2 3 4 5 Name & Description

Assembly and/or Component
Attaching parts for Assembly and/or Component
- - - * - - -
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
- - - * - - -
Parts of Detail Part
Attaching parts for Parts of Detail Part
- - - * - - -

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol - - - * - - - indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

"	INCH
#	NUMBER SIZE
ACTR	ACTUATOR
ADPTR	ADAPTER
ALIGN	ALIGNMENT
AL	ALUMINUM
ASSEM	ASSEMBLED
ASSY	ASSEMBLY
ATTEN	ATTENUATOR
AWG	AMERICAN WIRE GAGE
BD	BOARD
BRKT	BRACKET
BRS	BRASS
BRZ	BRONZE
BSHG	BUSHING
CAB	CABINET
CAP	CAPACITOR
CER	CERAMIC
CHAS	CHASSIS
CKT	CIRCUIT
COMP	COMPOSITION
CONN	CONNECTOR
COV	COVER
CPLG	COUPLING
CRT	CATHODE RAY TUBE
DEG	DEGREE
DWR	DRAWER
ELCTRN	ELECTRON
ELEC	ELECTRICAL
ELCTLT	ELECTROLYTIC
ELEM	ELEMENT
EPL	ELECTRICAL PARTS LIST
EQPT	EQUIPMENT
EXT	EXTERNAL
FIL	FILLISTER HEAD
FLEX	FLEXIBLE
FLH	FLAT HEAD
FLTR	FILTER
FR	FRAME or FRONT
FSTNR	FASTENER
FT	FOOT
FXD	FIXED
GSKT	GASKET
HDL	HANDLE
HEX	HEXAGON
HEX HD	HEXAGONAL HEAD
HEX SOC	HEXAGONAL SOCKET
HLCPS	HELICAL COMPRESSION
HLEXT	HELICAL EXTENSION
HV	HIGH VOLTAGE
IC	INTEGRATED CIRCUIT
ID	INSIDE DIAMETER
IDENT	IDENTIFICATION
IMPLR	IMPELLER
IN	INCH
INCAND	INCANDESCENT
INSUL	INSULATOR
INTL	INTERNAL
LPHLDR	LAMPHOLDER
MACH	MACHINE
MECH	MECHANICAL
MTG	MOUNTING
NIP	NIPPLE
NON WIRE	NOT WIRE WOUND
OBD	ORDER BY DESCRIPTION
OD	OUTSIDE DIAMETER
OVH	OVAL HEAD
PH BRZ	PHOSPHOR BRONZE
PL	PLAIN or PLATE
PLSTC	PLASTIC
PN	PART NUMBER
PNH	PAN HEAD
PWR	POWER
RCPT	RECEPTACLE
RES	RESISTOR
RGD	RIGID
RLF	RELIEF
RTNR	RETAINER
SCH	SOCKET HEAD
SCOPE	OSCILLOSCOPE
SCR	SCREW
SE	SINGLE END
SECT	SECTION
SEMICOND	SEMICONDUCTOR
SHLD	SHIELD
SHLDR	SHOULDERED
SKT	SOCKET
SL	SLIDE
SLFLKG	SELF-LOCKING
SLVG	SLEEVING
SPR	SPRING
SQ	SQUARE
SST	STAINLESS STEEL
STL	STEEL
SW	SWITCH
T	TUBE
TERM	TERMINAL
THD	THREAD
THK	THICK
TNSN	TENSION
TPG	TAPPING
TRH	TRUSS HEAD
V	VOLTAGE
VAR	VARIABLE
W	WITH
WSHR	WASHER
XFMR	TRANSFORMER
XSTR	TRANSISTOR

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
12360	ALBANY PRODUCTS CO., DIV OF PNEUMO DYNAMICS CORPORATION	145 WOODWARD AVENUE	SOUTH NORWALK, CT 06586
15912	ANSLEY ELECTRONICS CORP., A SUB OF THOMAS AND BETTS CORP.	3208 HUMBOLDT ST.	LOS ANGELES, CA 90065
22526	BERG ELECTRONICS INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
45722	USM CORP., PARKER-KALON FASTENER DIV.		CAMPBELLSVILLE, KY 42718
71279	CAMBRIDGE THERMIONIC CORP.	445 CONCORD AVE.	CAMBRIDGE, MA 02138
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
73803	TEXAS INSTRUMENTS, INC., METALLURGICAL MATERIALS DIV.	34 FOREST STREET	ATTLEBORO, MA 02703
74445	HOLO-KROME CO.	31 BROOK ST. WEST	HARTFORD, CT 06110
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
78471	TILLEY MFG. CO.	900 INDUSTRIAL RD.	SAN CARLOS, CA 94070
79136	WALDES, KOHINOOR, INC.	47-16 AUSTEL PLACE	LONG ISLAND CITY, NY 11101
79807	WROUGHT WASHER MFG. CO.	2100 S. O BAY ST.	MILWAUKEE, WI 53207
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
97464	INDUSTRIAL RETAINING RING CO.	57 CORDIER ST.	IRVINGTON, NJ 07111
98291	SEALECTRO CORP.	225 HOYT	MAMARONECK, NY 10544

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-1	337-1399-04			2		SHIELD,ELEC:SIDE	80009	337-1399-04
-2	366-1031-05			1		KNOB:RED--CAL	80009	366-1031-05
	213-0153-00			1		. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-3	366-1170-01			1		KNOB:GRAY,4 SIDED	80009	366-1170-01
	213-0153-00			2		. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-4	366-0494-00			2		KNOB:GRAY	80009	366-0494-00
	----- -----			-		. EACH KNOB INCLUDES:		
	213-0153-00			1		. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-5	366-1422-01			1		KNOB:LATCH	80009	366-1422-01
						(ATTACHING PARTS)		
-6	214-1840-00			1		PIN,KNOB SECRG:0.094 OD X 0.120 INCH LONG	80009	214-1840-00
						- - - * - - -		
-7	----- -----			2		RESISTOR,VAR:(SEE R150 AND R260 EPL)		
						(ATTACHING PARTS FOR EACH)		
-8	210-0583-00			1		NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20224-402
-9	210-0940-00			2		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
						- - - * - - -		
-10	----- -----			2		CONNECTOR,RCPT,:(SEE J100 AND J210 EPL)		
						(ATTACHING PARTS FOR EACH)		
-11	210-0255-00			1		TERMINAL,LUG:0.391" ID INT TOOTH	80009	210-0255-00
						- - - * - - -		
-12	358-0029-00			1		BSHG,MACH.THD:HEX,0.375-32 X 0.438"LONG	80009	358-0029-00
						(ATTACHING PARTS)		
-13	220-0495-00			1		NUT,PLAIN,HEX.:0.375-32 X 0.438 INCH BRS	73743	OBD
-14	210-0978-00			1		WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL	78471	OBD
						- - - * - - -		
-15	426-0681-00			8		FR,PUSH BUTTON:GRAY PLASTIC	80009	426-0681-00
-16	426-0916-00			1		FRAME,RDOUT WDO:	80009	426-0916-00
-17	333-1774-01			1		PANEL,FRONT:	80009	333-1774-01
-18	331-0314-00			1		WINDOW,READOUT:RED	80009	331-0314-00
-19	214-1513-01			1		LCH,PLUG-IN RET:	80009	214-1513-01
						(ATTACHING PARTS)		
-20	213-0254-00			1		SCR,TPG,THD CTG:2-32 X 0.250,100 DEG,FLH	45722	OBD
						- - - * - - -		
-21	337-1872-00			1		SHLD,ELECTRICAL:SUBPANEL	80009	337-1872-00
-22	----- -----			1		CKT BOARD ASSY:DISPLAY(SEE A3 EPL)		
						(ATTACHING PARTS)		
-23	211-0004-00			2		SCREW,MACHINE:3-48 X 0.125,PNH,STL	83385	OBD
						- - - * - - -		
-24	----- -----			4		. LAMP,LED:(SEE DS825,DS826,DS827,DS828)		
-25	136-0252-00			8		. SOCKET,PIN TERM:0.145 INCH LONG	00779	2-330808-7
-26	136-0387-00			2		JACK,TIP:GRAY	71279	4352-1-0318
-27	----- -----			1		SWITCH,SLIDE:(SEE S90 EPL)		
-28	386-2671-01			1		SUBPANEL,FRONT:	80009	386-2671-01
						(ATTACHING PARTS)		
-29	213-0229-00			2		SCR,TPG,THD FOR:6-20 X0.375"100 DEG,FLH STLL	83385	OBD
-30	213-0227-00			2		SCR,TPG,THD FOR:6-32 X 0.50 DEG,FLH ST	83385	OBD
						- - - * - - -		
-31	366-1257-28			2		PUSH BUTTON:GRAY--+SLOPE	80009	366-1257-28
-32	366-1489-66			2		PUSH BUTTON:GRAY--X20 ATTEN	80009	366-1489-66
-33	366-1257-27			2		PUSH BUTTON:--AC COUPL	80009	366-1257-27
-34	337-1897-00			1		SHLD,ELECTRICAL:	80009	337-1897-00
						(ATTACHING PARTS)		
-35	211-0503-00			3		SCREW,MACHINE:6-32 X 0.188 INCH,PNH STL	83385	OBD
-36	384-0519-00			2		POST,ELEC-MECH:HEX,0.25 X 0.562 INCH	80009	384-0519-00
-37	210-0407-00			2		NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS	73743	3038-0228-402
-38	211-0511-00			2		SCREW,MACHINE:6-32 X 0.50 INCH,PNH STL	83385	OBD
-39	166-0031-00			2		SPACER,SLEEVE:0.18 ID X 0.25 INCH LONG	80009	166-0031-00
						- - - * - - -		
-40	131-0938-00			2		CONNECTOR,RCPT,:50 OHM MALE SNAP-ON	98291	051-043-0349
-41	407-1352-00			1		BRACKET,CKT CD:	80009	407-1352-00
						(ATTACHING PARTS)		
-42	210-0586-00			2		NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	OBD
						- - - * - - -		

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-43	384-1099-00			2		EXTENSION SHAFT:PUSH BUTTON,1.54 INCH LONG	80009	384-1099-00
-44	----- -----			1		CKT BOARD ASSY:LEVEL OUT(SEE A4 EPL)		
						(ATTACHING PARTS)		
-45	211-0514-00			1		SCREW,MACHINE:6-32 X 0.750 INCH,PNH STL	83385	OBD
						- - - * - - -		
-46	166-0032-00			1		SPACER,SLEEVE:0.18 ID X 0.313 INCH LONG	80009	166-0032-00
	----- -----			-		. CKT BOARD ASSY INCLUDES:		
	136-0514-00			1		. SOCKET,PLUG IN:MICROCIRCUIT,8 CONTACT	73803	C9308-02
-47	----- -----			1		CKT BOARD ASSY:TRIGGER(SEE A2 EPL)		
						(ATTACHING PARTS)		
-48	213-0336-00			4		SCR,TPG,THD FOR:6-32 X 1.25 INCH,PNH STL	83385	OBD
-49	361-0516-00			4		SPACER,SLEEVE:0.189 OD X 0.986"LONG BRS	80009	361-0516-00
						- - - * - - -		
	----- -----			-		. CKT BOARD ASSY INCLUDES:		
-50	131-0608-00			6		. CONTACT,ELEC:0.365 L X 0.25 PH BRZ GOLD PL	22526	47357
-51	136-0252-04[1]	B010100	B010949	222		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
	136-0252-04[1]	B010950		270		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
	136-0252-04[2]	B010100	B010969	222		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
	136-0252-04[2]	B010970		270		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
	136-0252-04[3]	B010100	B010773	222		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
	136-0252-04[3]	B010774		270		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
-52	136-0260-02[1]	B010100	B010949	13		. SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
	136-0260-02[1]	B010950		10		. SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
	136-0260-02[2]	B010100	B010969	13		. SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
	136-0260-02[2]	B010970		10		. SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
	136-0260-02[3]	B010100	B010773	13		. SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
	136-0252-04[3]	B010774		10		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
-53	136-0269-02			10		. SOCKET,PLUG-IN:14 CONTACT,LOW CLEARANCE	01295	C931402
-54	214-0579-00			4		. TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
-55	----- -----			2		. SWITCH,PUSH:(SEE S185 AND S295 EPL)		
-56	----- -----			2		. SWITCH,PUSH:(SEE S105A,B S215A,B EPL)		
-57	361-0384-00			12		. SPACER,PB SW:0.133 INCH LONG	80009	361-0384-00
-58	175-1405-00			3		CA ASSY,SP,ELEC:FLAT,2 INCHES LONG	15912	FST 22A-10
-59	366-1257-30			1		PUSH BUTTON:GRAY--RESET	80009	366-1257-30
-60	366-1402-64			1		PUSH BUTTON:GRAY--IN START OUT	80009	366-1402-64
-61	----- -----[1]			1		. CKT BOARD ASSY:REGULATOR(SEE A5 EPL)		
-62	131-1343-00[1]	XB010950		1		. CONTACT ASSY,EL:36 PIN SET	22526	65274-2
	131-1343-00[2]	XB010970		1		. CONTACT ASSY,EL:36 PIN SET	22526	65274-2
	131-1343-00[3]	XB010774		1		. CONTACT ASSY,EL:36 PIN SET	22526	65274-2
-63	136-0252-04[1]	XB010950		1		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
	136-0252-04[2]	XB010970		1		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
	136-0252-04[3]	XB010774		1		. SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
	198-3612-00[1]	XB010950		1		. WIRE SET,ELEC:	80009	198-3612-00
	198-3612-00[2]	XB010970		1		. WIRE SET,ELEC:	80009	198-3612-00
	198-3612-00[3]	XB010774		1		. WIRE SET,ELEC:	80009	198-3612-00
-64	131-0707-00			6		. . CONTACT,ELEC:0.48" L,22-26 AWG WIRE	22526	75691-005
-65	352-0161-01			1		. . CONN BODY,PL,EL:3 WIRE BROWN	80009	352-0161-01
	352-0161-02			1		. . CONN BODY,PL,EL:3 WIRE RED	80009	352-0161-02
-66	175-0826-00			FT		. . WIRE,ELECTRICAL:3 WIRE RIBBON	80009	175-0826-00
	672-0547-00[2]			1		CKT BOARD ASSY:MAIN,W/CAM SW	80009	672-0547-00
	672-0548-00[1]			1		CKT BOARD ASSY:MAIN,W/CAM SW	80009	672-0548-00
-67	384-0461-00			1		. EXTENSION SHAFT:MAIN/,W/CAM	80009	384-0461-00
-68	376-0051-01			1		. CPLG,SHAFT,FLEX:FOR 0.125 INCH DIA SHAFTS	80009	376-0051-01
	213-0048-00			4		. . SETSCREW:4-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-69	----- -----			1		. RES,VARIABLE:(SEE R475 EPL)		
						(ATTACHING PARTS)		
-70	210-0583-00			1		. NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20224-402
-71	210-0046-00			1		. WASHER,LOCK:INTL,0.26 ID X 0.40" OD,STL	78189	1214-05-00-0541C
						- - - * - - -		
-72	407-0579-00			1		. BRKT,RES.MTG:	80009	407-0579-00
	----- -----			1		. ACTUATOR ASSY:(SEE A195 EPL)		
						(ATTACHING PARTS)		
-73	211-0116-00			4		. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
						- - - * - - -		

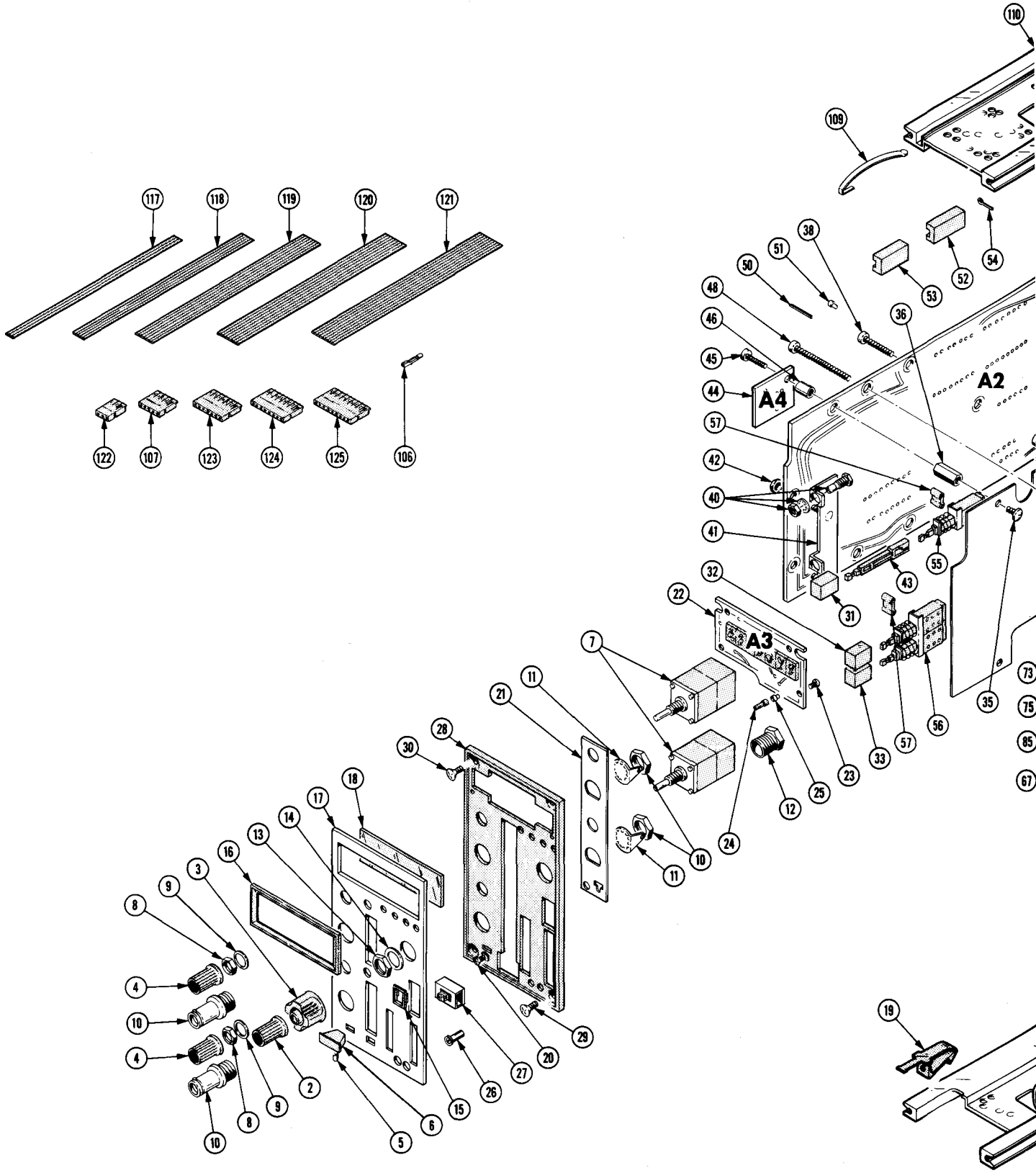
[1]Standard only
[2]Option 1 only
[3]Option 4 only

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-	----- -----			-		. . ACTUATOR ASSY INCLUDES:		
-74	200-1332-00			1		. . COVER,CAM SW:	80009	200-1332-00
-75	210-0406-00			2		. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-76	214-1704-01			2		. . SPRING,FLAT:CAM SW DETENT,0.008 INCH THK	80009	214-1704-01
-77	214-1127-00			2		. . ROLLER,DETENT:0.125 DIA X 0.125 INCH L	80009	214-1127-00
-78	105-0516-00			1		. . DRUM,CAM SWITCH:	80009	105-0516-00
						(ATTACHING PARTS)		
-79	354-0219-00			1		. . RING,RETAINING:FOR 0.25 INCH SHAFT	79136	5103-25-MD-R
						- - - * - - -		
-80	401-0155-00			1		. . BEARING,CAM SW:FRONT	80009	401-0155-00
-81	210-0406-00			2		. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-82	401-0156-00			1		. . BEARING,CAM SW:REAR	80009	401-0156-00
-83	214-1962-00			2		. LEVER,SLIDE SW:	80009	214-1962-00
						(ATTACHING PARTS FOR EACH)		
-84	354-0165-00			1		. RING,RETAINING:0.114 FREE IDX 0.025 INCH	97464	1000-15
						- - - * - - -		
-85	386-2709-00			1		. PLATE,LEVER MTG:	80009	386-2709-00
						(ATTACHING PARTS)		
-86	210-0405-00			2		. NUT,PLAIN,HEX.:2-56 X 0.188 INCH,BRS	73743	2X12157-402
	210-0001-00			2		. WASHER,LOCK:INTL,0.092 ID X 0.18"OD,STL	78189	1202-00-00-0541C
	210-1008-00			2		. WASHER,FLAT:0.09 ID X 0.188" OD,BRS	12360	OBD
						- - - * - - -		
-87	384-1242-00			1		. EXTENSION SHAFT:LEVER SWITCH,REAR	80009	384-1242-00
	384-1160-01			1		. EXTENSION SHAFT:LEVER SWITCH,FRONT	80009	384-1160-01
-88	----- -----			1		. CKT BOARD ASSY:MAIN(SEE A1 EPL)		
	105-0587-00			2		. . ACTR ASSY,SL SW:	80009	105-0587-00
	----- -----			-		. . . EACH ACTUATOR INCLUDES:		
-89	376-0156-00			1		. . . COUPLING,SHAFT:SLIDE SWITCH	80009	376-0156-00
-90	214-1126-01			2		. . . SPRING,FLAT:GREEN COLORED	80009	214-1126-01
-91	214-1127-00			2		. . . ROLLER,DETENT:0.125 DIA X 0.125 INCH L	80009	214-1127-00
-92	105-0504-00			1		. . . ACTUATOR,SWITCH:	80009	105-0504-00
-93	351-0355-00			1		. . . GUIDE,SLIDE SW:	80009	351-0355-00
-94	131-0604-00			20		. . CONTACT,ELEC:CKT CD SW,SPR	80009	131-0604-00
-95	131-0608-00			39		. . CONTACT,ELEC:0.365 L X 0.25 PH BRZ GOLD PL	22526	47357
-96	136-0252-04			128		. . SOCKET,PIN TERM:0.188 INCH LONG	22526	75060
-97	136-0260-02			7		. . SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
-98	136-0269-02[1]			21		. . SOCKET,PLUG-IN:14 CONTACT,LOW CLEARANCE	01295	C931402
	136-0269-02[2]			20		. . SOCKET,PLUG-IN:14 CONTACT,LOW CLEARANCE	01295	C931402
-99	214-0579-00[1]			3		. . TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
	214-0579-00[2]			6		. . TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
-100	----- -----			1		. . SWITCH,SLIDE:(SEE S900 EPL)		
-101	----- -----			2		. . SWITCH,PUSH:(SEE S545,S575 EPL)		
-102	361-0382-00			4		. . SPACER,PB SW:BROWN,0.275 INCH LONG	80009	361-0382-00
-103	344-0154-00[2]			2		. . CLIP,ELECTRICAL:FOR 0.25 INCH DIA FUSE	80009	344-0154-00
-104	----- -----[2]			1		. . OSCILLATOR,RF:(SEE Y901 EPL)		
						(ATTACHING PARTS)		
-105	210-1014-00[2]			4		. . WASHER,NONMETAL:0.094 ID X 0.312" OD,TEFLON	80009	210-1014-00
						- - - * - - -		
	198-3030-00[1]	B010630		1		. . WIRE SET,ELEC:	80009	198-3030-00
-106	131-0707-00			15		. . CONTACT,ELEC:0.48" L,22-26 AWG WIRE	22526	75691-005
	175-0828-00			FT		. . . WIRE,ELECTRICAL:5 WIRE RIBBON	08261	OBD
-107	352-0163-05			3		. . . CONN BODY,PL,EL:5 WIRE GREEN	80009	352-0163-05
	198-3033-00[2]	B010660		1		. . WIRE SET,ELEC:	80009	198-3033-00
	131-0707-00			15		. . CONTACT,ELEC:0.48" L,22-26 AWG WIRE	22526	75691-005
	175-0828-00			FT		. . . WIRE,ELECTRICAL:5 WIRE RIBBON	08261	OBD
	352-0163-05			3		. . . CONN BODY,PL,EL:5 WIRE GREEN	80009	352-0163-05
-108	384-1136-00			2		EXTENSION SHAFT:0.95 INCH LONG	80009	384-1136-00
-109	214-1061-00			1		SPRING,GROUND:FLAT	80009	214-1061-00
-110	426-0725-05			1		FR SECT,PLUG-IN:TOP	80009	426-0725-05
-111	----- -----[1]			2		TRANSISTOR:(SEE Q10 & Q30 EPL)		
						(ATTACHING PARTS FOR EACH)		
-112	211-0038-00[1]	XB010950		1		SCREW,MACHINE:4-40 X 0.312"100 DEG,FLH STL	83385	OBD
	211-0038-00[2]	XB010970		1		SCREW,MACHINE:4-40 X 0.312"100 DEG,FLH STL	83385	OBD
	211-0038-00[3]	XB010774		1		SCREW,MACHINE:4-40 X 0.312"100 DEG,FLH STL	83385	OBD

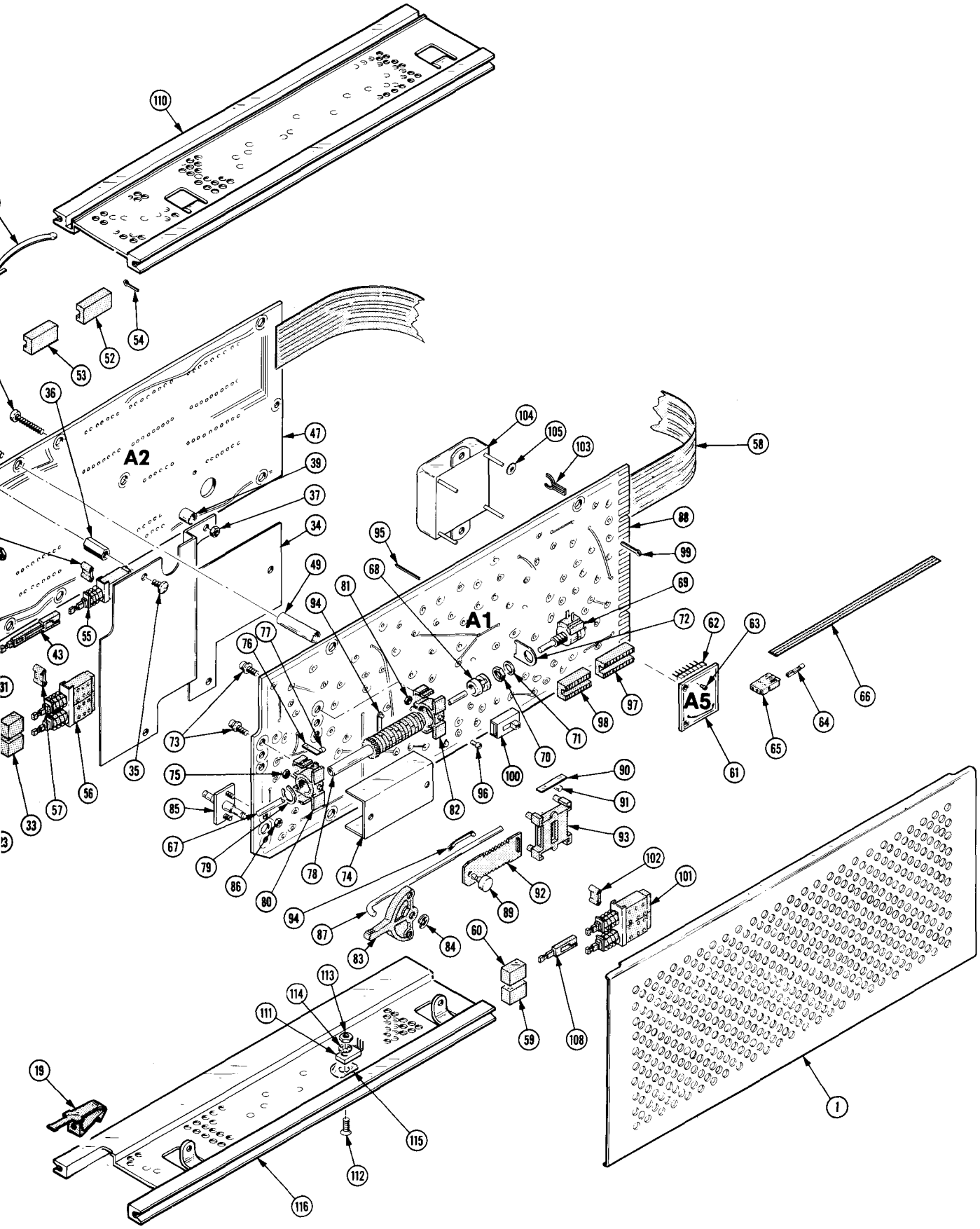
[1]Standard only
[2]Option 1 only
[3]Option 4 only

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-113	210-0551-00[1]	XB010950		1		NUT,PLAIN,HEX.:4-40 X 0.25 INCH,STL	83385	OBD
	210-0551-00[2]	XB010970		1		NUT,PLAIN,HEX.:4-40 X 0.25 INCH,STL	83385	OBD
	210-0551-00[3]	XB010774		1		NUT,PLAIN,HEX.:4-40 X 0.25 INCH,STL	83385	OBD
-114	210-0004-00[1]	XB010950		1		WASHER,LOCK:INTL,0.12 ID X 0.26"OD,STL	78189	1204-00-00-0541C
	210-0004-00[2]	XB010970		1		WASHER,LOCK:INTL,0.12 ID X 0.26"OD,STL	78189	1204-00-00-0541C
	210-0004-00[3]	XB010774		1		WASHER,LOCK:INTL,0.12 ID X 0.26"OD,STL	78189	1204-00-00-0541C
-115	210-0921-00[1]	XB010950		1		WASHER,MICA:0.50 X 0.141 X 0.005 INCH THK	80009	210-0921-00
	210-0921-00[2]	XB010970		1		WASHER,MICA:0.50 X 0.141 X 0.005 INCH THK	80009	210-0921-00
	210-0921-00[3]	XB010774		1		WASHER,MICA:0.50 X 0.141 X 0.005 INCH THK	80009	210-0921-00
						- - - * - - -		
-116	426-0724-11			1		FR SECT,PLUG-IN:BOTTOM	80009	426-0724-11
-117	175-0826-00			FT		WIRE,ELECTRICAL:3 WIRE RIBBON	80009	175-0826-00
-118	175-0828-00	B010100	B010629	FT		WIRE,ELECTRICAL:5 WIRE RIBBON	08261	OBD
	175-0828-00[3]			FT		WIRE,ELECTRICAL:5 WIRE RIBBON	08261	OBD
-119	175-0830-00			FT		WIRE,ELECTRICAL:7 WIRE RIBBON	08261	OBD
-120	175-0831-00			FT		WIRE,ELECTRICAL:8 WIRE RIBBON	08261	OBD
-121	175-0832-00			FT		WIRE,ELECTRICAL:9 WIRE RIBBON	08261	OBD
	131-0707-00			24		CONTACT,ELEC:0.48" L,22-26 AWG WIRE	22526	75691-005
-122	352-0161-04			1		CONN BODY,PL,EL:3 WIRE YELLOW	80009	352-0161-04
	352-0161-05			1		CONN BODY,PL,EL:3 WIRE GREEN	80009	352-0161-05
	352-0163-05	B010100	B010629	1		CONN BODY,PL,EL:5 WIRE GREEN	80009	352-0163-05
-123	352-0165-07			1		CONN BODY,PL,EL:7 WIRE VIOLET	80009	352-0165-07
-124	352-0166-08			1		CONN BODY,PL,EL:8 WIRE GRAY	80009	352-0166-08
-125	352-0167-09			1		CONN BODY,PL,EL:9 WIRE WHITE	80009	352-0167-09
						ACCESSORIES		
	070-1984-00			1		MANUAL,TECH:INSTRUCTION(NOT SHOWN)	80009	070-1984-00
	012-0532-00			1		CABLE ASSY,RF:03.5 F LONG	80009	012-0532-00

[1]Standard only
[2]Option 1 only
[3]Option 4 only



REV. A APR 1977



DC 505A

MANUAL CHANGE INFORMATION

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Since the change information sheets are carried in the manual until all changes are permanently entered, some duplication may occur. If no such change pages appear following this page, your manual is correct as printed.

SERVICE NOTE

Because of the universal parts procurement problem, some electrical parts in your instrument may be different from those described in the Replaceable Electrical Parts List. The parts used will in no way alter or compromise the performance or reliability of this instrument. They are installed when necessary to ensure prompt delivery to the customer. Order replacement parts from the Replaceable Electrical Parts List.

CALIBRATION TEST EQUIPMENT REPLACEMENT

Calibration Test Equipment Chart

This chart compares TM 500 product performance to that of older Tektronix equipment. Only those characteristics where significant specification differences occur, are listed. In some cases the new instrument may not be a total functional replacement. Additional support instrumentation may be needed or a change in calibration procedure may be necessary.

Comparison of Main Characteristics

DM 501 replaces 7D13		
PG 501 replaces 107	PG 501 - Risetime less than 3.5 ns into 50 Ω.	107 - Risetime less than 3.0 ns into 50 Ω.
108	PG 501 - 5 V output pulse; 3.5 ns Risetime	108 - 10 V output pulse 1 ns Risetime
PG 502 replaces 107		
108	PG 502 - 5 V output	108 - 10 V output
111	PG 502 - Risetime less than 1 ns; 10 ns Pretrigger pulse delay	111 - Risetime 0.5 ns; 30 to 250 ns Pretrigger pulse delay
PG 508 replaces 114	Performance of replacement equipment is the same or better than equipment being replaced.	
115		
2101		
PG 506 replaces 106	PG 506 - Positive-going trigger output signal at least 1 V; High Amplitude output, 60 V.	106 - Positive and Negative-going trigger output signal, 50 ns and 1 V; High Amplitude output, 100 V.
067-0502-01	PG 506 - Does not have chopped feature.	0502-01 - Comparator output can be alternately chopped to a reference voltage.
SG 503 replaces 190, 190A, 190B	SG 503 - Amplitude range 5 mV to 5.5 V p-p.	190B - Amplitude range 40 mV to 10 V p-p.
191		
067-0532-01	SG 503 - Frequency range 250 kHz to 250 MHz.	0532-01 - Frequency range 65 MHz to 500 MHz.
SG 504 replaces 067-0532-01	SG 504 - Frequency range 245 MHz to 1050 MHz.	0532-01 - Frequency range 65 MHz to 500 MHz.
067-0650-00		
TG 501 replaces 180, 180A	TG 501 - Trigger output-slaved to marker output from 5 sec through 100 ns. One time-mark can be generated at a time.	180A - Trigger pulses 1, 10, 100 Hz; 1, 10, and 100 kHz. Multiple time-marks can be generated simultaneously.
181		181 - Multiple time-marks
184	TG 501 - Trigger output-slaved to market output from 5 sec through 100 ns. One time-mark can be generated at a time.	184 - Separate trigger pulses of 1 and 0.1 sec; 10, 1, and 0.1 ms; 10 and 1 μs.
2901	TG 501 - Trigger output-slaved to marker output from 5 sec through 100 ns. One time-mark can be generated at a time.	2901 - Separate trigger pulses, from 5 sec to 0.1 μs. Multiple time-marks can be generated simultaneously.

NOTE: All TM 500 generator outputs are short-proof. All TM 500 plug-in instruments require TM 500-Series Power Module.

TEKTRONIX®
committed to technical excellence

MANUAL CHANGE INFORMATION

PRODUCT DC505A
070-1984-00

CHANGE REFERENCE M34427
DATE 9-12-78

CHANGE:	DESCRIPTION

EFF SN B031920

ELECTRICAL PARTS LIST CHANGES

CHANGE TO:

A4	670-4227-01	CKT BOARD ASSY:LEVEL OUT
U90	156-0158-01	MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER,SEL

MECHANICAL PARTS LIST CHANGES

Page 6-4

Fig. 1-46

REMOVE:

	136-0514-00	1	SOCKET,PLUG IN:MICROCIRCUIT,8 CONTACT